THE

SOUTHERN AGRICULTURIST.

SEPTEMBER, 1830.

PART I.

ORIGINAL CORRESPONDENCE.

ART. 1.—*On making Sugar from Beets, in a Letter from the* Hon. WILLIAM JOHNSON, *of South-Carolina, to the* Hon. JACOB BURNETT, *of Ohio.*

(Continued from page 400.)

Preparation of the Ground.—This is done by working, manuring and rotation of crops. The French plough, harrow and roll their ground, what we would substitute for this more perfect application of the means of good husbandry, will depend much upon the habits, more or less slovenly, of the various parts of our country. The land, however, should be put in high order. I would give it three ploughings and a rolling or harrowing, or both. The quantity cultivated would be comparatively so small, that any quantity of labour might be bestowed upon preparing it. Some idea may be formed of this when it is mentioned that Achard supposes that sixteen square miles cultivated in Beets, would supply the whole kingdom of Prussia with Sugar. The Beet appears not to demand any great and immediate supply of manure, but it does require tillage, and is, therefore, ranked among the best preparing crops, and in France, dispenses with a fallowing or takes the place of it.

The following is a summary of the several series, or alternations of crops, which have been adopted into French husbandry, in the places where the Beet has been permanently introduced.

1st year. Wheat, oats, rye, barley or potatoes, manured.
2d Beets.
3d Wheat, barley or oats, with clover.
4th Clover:——or,
1st year. Oats or potatoes, manured.
2d Beets.
3d Wheat.

Manuring.—On this subject there is little peculiar to the Beet to be observed, except that when new and hot, it is not advisable to apply stable manures to the root of the Beet, as is suggested by the rotation of crops before exhibited. The author also notices that much use is made of the Beet-tops, and other remains of the Beet, for manure, by burying them into the soil whilst green, that is, soon after they are cut off, and so far as it is not proposed to feed them away to cattle or sheep.

Seeding.—This is done in France, in the latter part of March, or throughout April; but in case of disappointment, may be carried through May and into June. With us, it must be regulated by the breaking up of winter, and ability of the young plants to resist frost, of which the cultivator must be the judge from his own experience; we sow it in September, October and November. From seven to ten kilogrammes of grain, about fifteen or twenty pounds weight, will seed a hectare of land, about two acres French.

In France, the kilogramme costs less than fifty centimes, or about $\frac{47}{100}$, say half a dollar of our money.

It sometimes happens that the first seeding fails; if this happen from wet weather it is probable the seed has rotted in the ground and it must be replanted, but its springing may be retarded by dry weather for a month or six weeks. There is no remedy for this but patience, or irrigation.—Accidents from frost can only be repaired by replanting. But it sometimes happens that the seed is defective, being eaten by a small worm, which devours the kernel without perceptibly injuring the shell. Old seed is subject to this injury, and it is always prudent to try your seed in a box deposited in a warm place, after the manner of trying turnip or cabbage seed. So much time, however, is given for seeding, that notwithstanding these casualties, the crop can seldom fail if seed is to be had. It is always prudent, however, to be prepared against such casualties, by laying in a good store of seed.

The distance given to the plants varies greatly in French husbandry. On strong land it is less, on poor land greater, and varying from ten to twenty-four inches; but this is a subject on which every farmer will be called upon to exercise his own judgment, according to his own experience. I, who would never plant otherwise than in line, would leave space for a plough to turn between the drills, and leave from ten to eighteen inches between the plants, inverting the French rule by giving more space where the land is richest, but always having in view the size to which I wish to raise my plants. If smaller, the plants must be more crowded. But there is an important rule to be observed here; for if nature is too much cramped in her course or tendency to developement, she will certainly produce a decrepid issue, if not an abortion.

The French have three modes of seeding, the first is to sow broadcast, leaving a baulk or open space between the beds, for the purpose of receiving, by transplantation, the superabundant production of the space sown. When the plants attain the length of the finger, they turn in a numerous force of low-priced hands, and thin out the beds sown, filling up first the spaces on those beds where the seed has failed, and transplanting the rest to the baulks between.

The second method is to sow, in fact, a nursery very thick, and when the root is near as thick as the finger, to thin it out, leaving as many as can be reared in the nursery, and setting out the rest in land properly prepared to receive them.

The last, and in my opinion the only one which ought to be adopted, is to drill it. This the author recommends strongly, as the best mode. And it seems that they have adopted into use the English horse-drill, and some other machines of the same kind, of their own invention. But I fear we shall find very little land in our country in sufficient tilth to admit of the use of such machines, and which at last, are, perhaps, only adapted to the use of your gentleman-farmers, who are more attached to a neat operation, than a profitable one. If the Beet is to be cultivated extentensively in our country, it must be effected according to our own agricultural habits. I calculate on the use of the plough, this will require three feet between the rows. The trench may be traced with a small drill-plough, and the seed is not too small to be dropped by the hand and covered by the foot. This is the work of inferior and cheap hands,

and may be economically applied even where you intend to cultivate with the hoe, in which alternative the drills may be two feet apart. By crossing the drill with a coulter at a foot apart, your seed may be laid as regularly as you please. It will always be prudent to drop two or three seeds where you mean only one plant to remain. It guards against the accidental failure of the seed, and furnishes a supply for transplanting to places where total failures may occur.

The foot pressed upon the place where the seed is dropped will generally give it a sufficient covering, which ought not to exceed an inch of light earth, calculated to settle down to half an inch.

Attending the Crop.—This is very simple: it consists only in keeping the earth stirred and the weeds down, and if the roots show a great tendency to rise above the surface, throw a light covering of earth on each side, by the plough or the hoe. The hoe must indispensably be used, since working between the plants can only be effected by it, and the narrow tobacco hoe will be found best adapted to the purpose. The leaves soon spread and keep down the grass, by covering the earth. When this takes place, of course the plough must be laid aside. Some persons gather the large leaves for their stock. But this process, if ever to be recommended, requires so much judgment in the execution, that it had better be dispensed with.

Harvesting the Beet.—The Beet is generally a biennial plant, not seeding until its second year. Yet this rule seems not to be general, or perhaps the characteristic may be lost by repeated production in a southern climate, or not found equally existing in every species. I have three varieties now under my eye; the common red, the yellow, and the red turnip-rooted; all planted at the same time. The two former have not seeded, but the latter is in full bearing.—Yet in four or five years' cultivation of the turnip-rooted Beet, which has not long been introduced here, I have never experienced the same thing before, except very partially. There may be something peculiar in the species, for it is the only variety that thrives thoroughly in this vicinity.

The fact, that the Beet generally is a biennial plant, would seem to lead to one of two conclusions, either that frost cannot kill the root, or that it is best adapted to a mild climate, contrary to the opinion of our author. It is ob-

vious that in a native state the root must live through the exposure of one winter, otherwise it becomes extinct in one year. In this climate, and probably some degrees farther north, the cold never freezes it, and seldom retards its growth. We sow it in September and October, and never think of drawing it, except for immediate use, or sheltering it at all. But in France it is otherwise, and is so in our Eastern States, where it is cultivated for export. This would seem to give us an advantage in cultivating the Beet, but it is very inconsiderable when duly estimated. The root must be drawn and transported to the factory, in any climate, and what it may gain with us in size during the winter, would probably be lost in the quality of the juice. While that which is gathered and housed in the North, would be improving in value by the escape of the aqueous particles.

When the root has attained the maturity for making Sugar, it is discovered by red spots appearing on the leaves, which then begin to roll up and incline to the earth. This occurs in France in September and October, and can always be verified by the air-bubble or by actual experiment. The process of making Sugar then commences, and the mill is supplied for some, time direct from the field.

As the cold increases, the roots are deposited in proper places of shelter, or in the ware-house of the mill. Very minute instructions are given for performing, economically, this, which is by far the most laborious operation to the cultivator. But the whole process consists in drawing the roots, cutting off the crowns, and piling or transporting them to market, or to the cellar or house of deposit; all this may very well be left to the judgment and means of the cultivator. Two things, however, it may be well to notice. The first is, the great advantage of gathering the roots in a dry time; they are more easily extracted, the earth can be shaken from the roots without washing, and the juice is always much more productive. The other is, that the labour of cutting off the heads is much facilitated by having the roots laid in lines, with their crowns toward each other, leaving an alley for the operator, through which he walks with a knife fixed to the end of a staff, and thus cuts each head with a single effort and downward motion. The heads then lie conveniently, either to be covered in for manure, or to be gathered and cured, or transported for the stock.

Profits.—In his eighth chapter, the author examines elaborately this all absorbing subject. And he does it first upon actual experiment, secondly upon calculations founded upon ascertained facts. But the latter, although seemingly upon very reasonable assumptions, greatly overgoes the result of the former. It is obvious that calculations of profit made upon the price of land, labour, manures, &c. in France, can afford no adequate means of determing the question of profit in our country. But the quantity in proportion to the land cultivated, may be approached if not determined. Accordingly, from an average of crops obtained from ten respectable farmers, in the same year, he finds the quantity produced to be 23,751 kilogrammes, about 47,500 pounds the hectare,* varying individually from 12,500 kilo. to 37,500 kilo. to the hectare. With this product, however, the author assigns very plausible reasons for being greatly dissatisfied, for if the hectar contains about 95,259 square feet, and each square foot will produce a root of a kilogramme in weight, it follows that each hectare should produce 95,259 kilogrammes, or about 180,518 weight of roots, which he says he has no doubt that the rich plains of the north of France will produce.

Let us present a calculation adapted to our own language and premises. We know here from actual experiment, that two square feet can be made to produce a Beet weighing eleven or twelve pounds, but to be very moderate, we will will take an acre of land, our measure, planted in Beets one foot apart, and allow three feet between the drills. This gives a Beet for every three feet, superficial measure, to which we may fairly allow four pounds weight. We will take the acre, for round numbers, to contain 44,000 square feet, which divided by 3, will give us 14,666 Beets. Estimating these at 4 lbs. each, we shall have a product of 55,664 lbs. of root. The Beet may be made to yeild 97 per cent. (p. 150) of juice, if perfectly operated upon, but we will take it at 60 per cent. which is the lowest product, and that yields us in round numbers 35,000 lbs. of juice, which at 5 per cent. produces 1750 lbs. of brown Sugar, besides the molasses.

This is not inferior to sugar cane, and compared with most other articles, of cultivation immensely profitable. To

* A kilogramme is a little more than two pounds; a hectare a little above two acres.

cover casualties, we will reduce it to one-half, and if the Sugar yields but six cents per pound, the product realized will be very great per acre.

Preservation of the Beet root.—This the author regards as the most indispensable requisite to the success of sugar-making, and the greatest difficulty attending this branch of Agriculture. If, says he, we could gather it as it was wanted, as they do with cane, every difficulty would vanish. If this be literally true, it certainly leaves a great advantage in favour of those regions in which the climate renders it practicable.

"The preservation (he observes) during four months at least, is indispensable, for if it be proposed to work off a whole crop without housing any part, it would require means of such extent as would turn the scale of profit against the article. Besides that, one of the great advantages of its culture is that it furnishes moist food for animals during the severe season, an advantage which would be lost, if it were worked off in a short time, since the pulp would be lost."

As the vegetative force of the Beet continues after it is drawn, it is obvious that it must remain subject to important changes, and it would seem that some of these changes are favourable, and some unfavourable to the production of Sugar; since it has been found that the juice, sometimes, will not chrystalize, and thus compels the operator to resort to distillation, in order to indemnify himself. And yet, by suffering the Beet to remain somewhat longer, it produced very fine Sugar.

Heat generated from the mass of Beets itself appears to be the greatest evil to be dreaded, and this is avoided by not piling them in large masses, and by admitting as much air as will preserve a temperature from 10° of Reaunier down to the freezing point. It is probable that if stacked in long ricks upon layers of corn-stalks, or rye-straw, this danger would be avoided, and they might probably be thus preserved in stacks in the open field, covered well with straw, secured from being blown off.

A free circulation of air, as far as is consistent with avoiding freezing, is found never to injure the Beet, on the contrary, although it causes it to lose half its weight by evaporation, the Sugar remains and is more easily developed, although the difficulty of reducing the pulp is increased. Nor does it destroy its vegetative power, since if immersed

in water, it soon resumes it plumpness and tenderness. The crown, however, must not be wounded.

Effects of Frost.—The Beet will not freeze until the cold reaches from three to seven degrees below the freezing point; and then it suffers no injury for the purpose of making Sugar, except that it is more difficult to grind. But after freezing, if not worked off before a thaw ensues, it will certainly rot. Exposing it to sudden and great changes of temperature is found also to predispose it to rot.

There are five modes in which the Beet is preserved through the winter.

1. In the open air.
2. In ditches.
3. In cellars.
4. In store-houses.
5. In a mode recommeded by the author.

The first is, by piling it in convenient, dry, accessible place, covering it well with straw or leaves, and some add a covering of earth like that of a coal kiln.

2. The second is by digging ditches of such length as the crop may require, and after filling them and piling the roots up somewhat above the surface, to cover the whole with earth, so as to turn the rain, or with straw or leaves, and then with earth. This mode is recommended for convenience, and is found quite sufficient, provided the ditch be quite dry and not above four or five feet wide. It is favorable to preserving a regular temperature and not apt to ferment when the ditch is not above five feet wide and three deep.

3. The preservation in cellars partakes of the same advantages, provided they are dry and ventilated, and the root is not piled in too large a mass.

4. The preservation in barns, or store-houses, admits of the most perfect preservation, but care must be taken not to fill it too high, to deprive it of a circulation of air, or in any mode to increase the mass, so as to produce fermentation.

5. The improvement recommended by the author, consists only in providing the means of warming and ventilating at pleasure, a long, narrow ware-house, so as to preserve the plants from freezing in time of severe cold, and to facilitate the evaporation of the aqueous particles as much as may be deemed advisable.

(*To be continued.*)

ART. II.—*On the Cultivation of the Potatoe from the Vine; by* J. D.

Mr. Editor,—Notwithstanding my promise, I am almost induced to decline giving you any account of my mode of preparing land and planting the vine. This is an operation so common to every one, affluent and indigent, that I expect there is but little light to be thrown on it by me. But as I make a rule to comply with all my promises, I will not on this occasion, though trifling, depart from so good a general rule.

I am now preparing my land for the purpose of planting *slips*, hoping that by the time I am ready there will be a good shower of rain. I commence with my stubble land by laying it off four and a half feet wide with a bull-tongue plough. I follow with the hoe and list up the oat or wheat stubble, together with all the grass and weeds, in a line immediately on the mark made by the plough. I then follow with my plough and cover all the litter so listed, and break up the middle deep—by this operation you have a pretty good bed made. In this situation I let the land lay till a sufficient season comes—the land lying light retains all the water that falls without running off. As soon after the shower as possible follow with the hoe, and draw or dress up your bed. One hand can easily do from a half to three-quarters of an acre. Level the top of the bed with the hoe, which can be done almost as fast as a man can walk. Now lay on the vines in a line on the bed, from three to five vines, observing to join them well at the ends; bank them at the space of about every foot, leaving two or three inches of the vines bare between each. If you will plant in this way, on cow-pened land, or other strong soil, you will make the best of potatoes. The yam or leather-coat, I think grow largest from the vine.

While writing, I will just add, that corn crops are likely to be a little short in this situation, owing to the continued drought ever since the spring, especially in land that has been manured from the stable yard; indeed I think I may safely say, my manured land will be less productive than that not manured; unfortunately for me, I was quite industrious in collecting manure the last year, and a large por-

tion of my corn crop is lost. I don't mention this however, to discourage manuring, for it is the very life of Agriculture.

Respectfully, J. D.

Williamsburgh District, 6th July.

ART. III.—*On the Preservation of the Sweet Potatoe; by* A PLAIN FARMER.

"Prince William's Parish, April 13, 1830

Dear Sir,—In perusing the April number of the Agriculturist, I find that you wish to know the best way to keep the sweet potatoe. About the commencement of the present year I was compelled to move my seed potatoes from the place where they were first banked up. This was in January, and I put nothing on them except corn stalks, and nothing more was ever done with them until I was ready to plant, when to my astonishment, there was not more than a peck of rotten ones in a bank. I know that some persons are in the habit of banking their potatoes over, during the winter, whenever it rains. Furthermore I know, that one of my neighbours stripped all of the bark off the corn stalks, and put nothing but the bare stalks, yet his potatoes kept well. You know, Sir, that some planters are in the habit of putting pine trash or hay over their potatoes before they lay on the corn stalks; now I am perfectly satisfied that the corn stalks, alone, will keep them as well as any thing else. It is the old way, and I think the best.

I remain your's with esteem,

A PLAIN FARMER.

ART. IV.—*On the Cultivation of the Cuba Tobacco; by* JOSEPH M. HERNANDEZ.

To the EDITOR of the SOUTHERN AGRICULTURIST.

Sir,—The following communication on the Cuba tobacco, is from a gentleman who has had opportunities of becoming thoroughly acquainted with the mode of cultivating and curing the plant, as practiced in Cuba; and where experience has enabled him to ascertain the modifications neces-

sary to be adopted in transferring the culture to this country. It will be perceived that Gen. Hernandez estimates the value of the tobacco, *in leaf*, at 50 cents per pound; a higher price than it usually brings in our markets, where it is purchased for the purpose of being used as *wrappers* for segars; the *fillings* of which are generally of American or Virginia tobacco. It is well known, however, that the best tobacco raised in the island is never exported, being reserved for the manufacture of the celebrated Havana segars; after selling, as we have been informed, for more than a dollar a pound, as the tobacco raised and cured here, is considered by judges as no way inferior to the best Havana; it would probably sell for even a higher price than that estimated below, were it properly prepared for market, according to the Cuba method.

There can be no doubt but that this valuable plant may be easily added to the enriching staples, and other numerous resources that form the *golden fleece of the South;* which Northern monopolists find it so convenient to *shear*, but whose selfishness and cupidity, we trust, will not be much longer unresistingly submitted to. It is an advantage of this culture, that it affords an instance in which the manufacturing and agricultural interests are happily combined, as its highest profits can only be obtained by putting the tobacco into a wrought form, and making it into segars.

The subjoined directions will be found more specific and minute, than any that have before been given to the public, and will therefore, I hope, prove an acceptable contribution to the pages of the Agriculturist.

With respect, your obed't serv't,

W. H. SIMMONS.

Copy of a letter from Joseph M. Hernandez, Esq. to Dr. Wm. H. Simmons, dated

"Mala-Compra, 15th April, 1830.

Dear Sir,—I have delayed this communication on the culture of Cuba tobacco longer than I ought, but as you are acquainted with the multiplicity of engagements that have constantly occupied my attention, I trust that you will excuse me.

The first thing to be considered in this, as in every other culture, is the soil, which for this kind of tobacco ought to

be of a rich sandy loam, neither too high or too low; that is, ground capable of retaining moisture. The more level the better, and if possible, well protected by margins. The next should be the selection of a spot of ground to make the necessary beds. It would be preferable to make these on land newly cleared, or at all events when the land has not been seeded with grass: for grass seeds springing up together with the tobacco, would injure it materially, as the grass cannot be removed without disturbing the tobacco plants. In preparing the ground for the nurseries, break it up properly, grub up all the small stumps, dig out the roots, and carefully remove them with the hand; this being done, make the beds from three to four inches high, of a reasonable length, and from three to three and a half feet broad, so as to enable the hand, at arms' length, to weed out the tender young plants with the fingers from both sides of the bed, and keep them perfectly clean.

The months of December and January are the most proper for sowing the seed in this country*—some persons speak of planting it as early as the month of November; I am, however, of opinion that about the latter part of December is the best time to sow tobacco seed; any sooner would expose the plants to suffer from the inclemency of the most severe part of our winter season. Before the seed is sown, take some dry trash and burn it off upon the nursery beds, to destroy insects and grass seeds; then take one ounce of tobacco seed and mix it with about one quart of dry ashes, so as to separate the seed as much as possible, and sow it broad cast. After the seed has been thus sown, the surface of the bed ought to be raked over slightly, and trodden upon by the foot, carrying the whole weight of the body with it, that the ground may at once adhere closely to the seed, and then water it. Should the nursery beds apparently become dry from blighting winds or other causes, watering will be absolutely necessary; for the ground ought to be kept in a moist state from the time the seed is planted until the young plants are large enough to be set out.

The nurseries being made, proceed to prepare the land where the tobacco is to be set out. If the land is newly cleared, (and new land is probably more favourable to the production of this plant than it is to that of any other, both as respects quality and quan-

* Florida.

tity,) remove as many of the stumps and roots as possible, and dig up the ground in such a manner as to render the surface perfectly loose; then level the ground, and in this state leave it until the nursery plants have acquired about one half the growth necessary to admit of their being set out. Then break up the ground a second time in the same manner as at first, as in this way all the small fibres of roots and their rooted parts will be more or less separated, and thus obviate much of that degree of spunginess so common to new land, and which is, in a great measure, the cause of new land seldom producing well the first year, as the soil does not lay close enough to the roots of the plants growing in it; so that a shower of rain produces no other effect than that of removing the earth still more from them. Should the land be such as to admit of being worked with the plough, it ought certainly to be preferred to the common hoe. The plough, however, should be excluded after the plants are set out.

The ground having been prepared and properly levelled off, and the plants sufficiently grown to be taken up, say of the size of good cabbage plants, take advantage of the first wet or cloudy weather to commence setting them out. This should be done with great care, and the plants put single at equal distances; that is, about three feet North and South, and two and a half, or two and three-fourths feet East and West. They are placed thus close to each other, to prevent the leaves growing too large. The direction of the rows, however, should alter according to the situation of the land, where it has any inclination the widest space should run across it, as the beds will have to be made, so as to prevent the soil from being washed from the roots by rain, when bedded; but, where the land is rather level, the three feet rows should be North and South, so as to give to the plants a more free circulation of air, and that the sun may have a more full effect on them by passing across the beds, than by crossing them in an oblique direction. To set the plants out regularly, take a task line of 105 feet in length, with a pointed stick three feet long attached to each end of it, then insert a small piece of rag or something else through the line at the distance of two feet and three-fourths from each other, place it North and South, (or as the land may require,) at full length, and the set a plant at every division; carefully keeping the bud of the plant above the surface of

the ground. Then remove the line three feet from the first row, and so on until the planting is completed. Care ought also to be taken to prevent the stretching of the line from misplacing the plants. In this way the plants can be easily set out, and a proper direction given to them both ways. In taking the plants up from the nursery, the ground should be first loosened with a flat piece of wood, or iron, about an inch broad; then carefully holding the leaves closed towards each other, between the fingers, draw them up, and place them in a basket or some other convenient thing, to receive them for planting. After taking up those which can be planted during the day, water the nursery that the earth may again adhere to the remaining ones. The evening is the best time for setting out the plants, but where a large field has to be cultivated, it will be well to plant both morning and evening. The plants set out in the morning, unless in rainy or cloudy weather, should be covered immediately, and the same should be done with those planted the evening previous, should the day open with a clear sunshine—the palmetto leaf answers this purpose very well. There should be water convenient to the plants, so as to have them watered morning and evening, but more particularly in the evening, until they have taken root.* They should also be closely examined when watered, so as to replace such plants as happen to die, that the ground may be properly occupied, and that all the plants may ripen as nearly together as possible.

From the time the plants are set out, the earth round them should be occasionally stirred both with the hand and hoe. At first hoe flat, but as soon as the leaves assume a growing disposition, begin gradually to draw a slight bed towards the plant. The plants must be closely examined, even while in the nursery, to destroy the numerous worms that feed upon them, some, by cutting the stalk and gnawing the leaves when first set out—these resemble the grub-worm, and are to be found near the injured plant under ground; others which come from the eggs deposited on the plant by the butterfly, and feed on the leaf, grow to a very large size and look very ugly, and are commonly called the tobacco worm. There is also a small worm, which attacks the bud of the plant, and which is sure

* It is hence generally necessary that wells should be sunk at convenient distances through the field.

destruction to its further growth; and some again, though less destructive, are to be seen within the two coats of the leaf, feeding as it were on its juices alone. The worming should be strictly attended to every morning and evening, until the plants are pretty well grown, when every other day will be sufficient. The most proper persons for worming are either boys or girls of from ten to fourteen years of age. They should be made to come to the tobacco ground early in the morning, and be led by inducements, (such as giving a trifling reward to those who will bring the most worms,) to worm it properly. Grown persons would find it rather too tedious to stoop to examine the under part of every leaf, and seek the worm under ground; nor would they be so much alive to the value of a spoonful of sugar, or other light rewards. Besides, where the former would make this search a matter both of profit and pleasure, it would to the latter prove only a tedious and irksome occupation. Here I will observe, that it is for similar reasons that the culture of the Cuba tobacco plant more properly belongs to a white population, for there are few plants requiring more attention and tender treatment than this does. Indeed it will present a sorry appearance, unless the eye of its legitimate proprietor is constantly watching over it.

When the plants have acquired from twelve to fourteen good leaves, and are about knee high, it may be well to begin to top them, by nipping off the bud with the aid of the fore finger and thumb nail;* taking care not to destroy the small leaves immediately near the bud, for if the land is good and the season favourable, those very small top leaves will in a short time be nearly as large, and ripen quite as soon as the lower ones, whereby two or four more leaves may be saved; thus obtaining from sixteen to eighteen leaves in the place of twelve or fourteen, which is the general average. As the topping of the tobacco plant is all essential in order to promote the growth, and to equalize the ripening of the leaves, I would observe that this operation should at all events commence the instant that the bud of the plant shows a disposition to go to seed, and be immediately followed by removing the suckers, which it will now put out at every leaf. Indeed the suckers should be removed from the plant as often as they appear. The tobacco

* Washing the hands after this in water is necessary, as the acrid juices of the plants, otherwise, soon produce a soreness of the fingers.

plant ought never to be cut before it comes to full maturity, which is known by the leaves becoming mottled, coarse, and of a thick texture, and gummy to the touch; at which time the end of the leaf, by being doubled, will break short, which it will not do to the same extent when green. It ought not to be cut in wet weather, when the leaves lose their natural gummy substance, so necessary to be preversed. About this period the cultivator is apt to be rendered anxious by the fear of allowing the plants to remain in the field longer than is necessary, until experience removes these apprehensions; he should be on his guard, however, not to destroy the quality of his tobacco, by cutting it too soon. When the cutting is to commence, there should be procured a quantity of forked stakes, set upright, with a pole or rider resting on each fork, ready to support the tobacco, and to keep it from the ground. The plant is then cut obliquely even with the surface of the ground, and the person thus employed should strike the lower end of the stalk two or three times with the blunt side of his knife, so as to cause as much of the sand or soil to fall from it as possible; then tying two stalks together, they are gently placed across the riders or poles prepared to receive them. In this state they are allowed to remain in the sun or open air, until the leaves have somewhat wilted, whereby they will not be liable to the injury which they would otherwise receive if they came suddenly in contact with other bodies, when fresh cut. Then place as many plants on each pole or rider as may be conveniently carried, and take them into the drying house, where the tobacco is strung off upon the frames prepared for it, leaving a small space between the two plants, that the air may circulate freely among them, and promote their drying. As the drying advances, the stalks are brought closer to each other, so as to make room for those which yet remain to be housed.

In drying the tobacco all damp air should be excluded, nor ought the drying of it to be precipitated by the admission of high drying winds. This process is to be promoted in the most moderate manner, except in the rainy season, when the sooner the drying is effected the better, for it is a plant easily affected by the changes of the weather, after the drying commences. It is then liable to mildew in damp weather, which is, when the leaf changes from its original colour to a pale yellow cast, and from this, by parts, to an even brown. When the middle stem is perfectly dry, it can be taken down,

and the leaves stripped from the stalk and put in bulk to sweat; that is, to make tobacco of them, for before this process, when a concentration of its better qualities takes place, the leaves are always liable to be affected by the weather, and cannot well be considered as being any thing else than common dry leaves, partaking of the nature of tobacco, but not actually tobacco. The leaves are to be stript from the stalks in damp or cloudy weather, when they are more easily handled, and the separation of the different qualities rendered also more easy. The good leaves are at this time kept by themselves, for *wrappers* or *caps*, and the most defective ones for *fillings* or *tripa*. When the tobacco is put in bulk, the stems of the leaves should all be kept in one direction, to facilitate the tying of them in hanks; afterwards make the bulk two or three feet high, and of a proportionate circumference. To guard against the leaves becoming overheated, and to equalize the fermentation or sweating, after the first twenty-four hours place the outside leaves in the centre and those of the centre to the outside of the bulk. By doing this once or twice, and taking care to cover the bulk either with sheets or blankets, so as to exclude all air from it, and leaving it in this state for about forty days, it acquires an odour strong enough to produce sneezing, and the other qualities of cured tobacco. The process of curing may then be considered as completed. Then take some of the most injured leaves, but of the best quality, and in proportion to the quantity of tobacco made, and place them in clear water, there let them remain until they rot, which they will do in about eight days; then break open your bulks, spread the tobacco with the stems in one direction, and dampen them with this water in a gentle manner, that it may not soak through the leaf; for in this case, the leaf would rot.* Then tie them in hanks of from twenty-five to thirty leaves; this being done, spread the hanks in the tobacco-house for about twelve hours, to air them, that the dampness may be removed, and afterwards pack them in casks or barrels and head them tight, until you wish to manufacture them. The object of dampening the tobacco with this water, is to give it elasticity to promote its burning free, to increase its fragrance, to give it an aro-

* Sponge is used in Cuba for this delicate operation.

matic smell, and to keep it always soft. This is the great secret of curing tobacco for segars properly, and for which we are indebted to the people of Cuba, who certainly understand the mode of curing this kind of tobacco better than any other people. It is to them a source of great wealth and may be made equally so to us. We can have here three cuttings from the original plant—the last cutting will be of rather a weak quality, but which, nevertheless, will be agreeable to those who confine their smoking to weak tobacco.

In ratooning the plant, only one sprout ought to be allowed to grow, and this from those most deeply rooted—all other sprouts ought to be destroyed.

The houses necessary for the curing of tobacco ought to be roomy, with a passage way running through the centre, from one extremity of the building to the other, and pierced on both sides with sufficient number of doors and windows to make them perfectly airy.

In addition to what I have said respecting the mode of cultivating and treating the tobacco plant, I have further to state, that once the plant is allowed to be checked in its growth, it never again recovers it. That in promoting the drying of the leaf, fire should not be resorted to, because the smoke would impart to it a flavour that would injure that of the tobacco itself.

In order to obtain vigorous plants, the seed ought to be procured from the original stalk, and not from the ratoons, by allowing some of them to go to seed for that express purpose. In Cuba the seed is most generally saved from the ratoon plants, but we should consider that that climate and soil are probably more favourable to the production of this plant than ours, and, consequently, we ought to confide in the best seed, which is had from the original stalk.

All plants have their peculiar empire, nevertheless we should not be deterred from planting Cuba tobacco here, for even should we be compelled to import the seed every third year, which would be as often as would be necessary, it would still prove a profitable culture. Taking 600 lbs. which is the average product per acre, it would yield (if well cured,) at 50 cents per lb. $300, in the leaf.

The following exhibits the profits to be derived from it when manufactured into segars:—

600 lbs. allowing 8 lbs. to the 1000, would produce 75,000 segars, which, at $10 per thousand,		750 00
Cost of the leaf,	300 00	
Worth of manufacture at $2 50 per thousand,	187 50	487 50
Difference in favour of the manufacturer,		$262 50

This amount being the profits of the manufacturer alone, the profit to him who would combine both pursuits would be more than doubled.

As to the quantity of land which can be cultivated to the hand, there is some difference in the practice of planters, however, I think that I am within the usual calculation in saying, that an acre and a half would not exceed the quantity that an able hand can easily cultivate and manage properly.

I am, with respect, your obed't serv't,

JOSEPH M. HERNANDEZ.

N. B. I have omitted to state the cost of the segar boxes, which of course has also to be deducted. This would vary according to the facility of obtaining materials, but probably would not exceed 25 cents per box.

To Dr. Wm. H. Simmons.

ART. V.—*On Plantation Gardens, and the Culture of Vegetables; by the* EDITOR.

(Continued from page 423.)

Turnips.

These, like cabbages, arrive at their greatest perfection during the autumn and winter, and are more generally cultivated on our plantations than any other vegetable. The varieties are numerous, but from these may be selected as best for our purpose, the Early Dutch, Six Weeks, Early Stone, White, Red and Green Topped Norfolks, and the Globe, also, Ruta Baga, which is perhaps superior to them all, either for the table or for cattle. For this last we shall give directions in a separate section, and will now confine ourselves to the common varieties. The Early Dutch and Six Week's Turnips, are equally good and are the earliest varieties cultivated. The Norfolks are also excellent varieties, but come in much later.

The usual course of culture on our plantations, has been to cow-pen a piece of ground, to sow the seed broad-cast and rake them in—after which, very little more is ever done. It is seldom that they are introduced into the garden, and receive that attention which is bestowed on other vegetables, yet even with this management we have seen as fine roots raised as have been produced by any other course, and we ascribe it, mainly, to the quantity of urine with which the soil is fertilized, by the cattle being penned on it, and which is in a great measure lost to us, in consequence of the injudicious course we persue in collecting and preserving our manures. Were our management better, the same number of cattle would afford sufficient manure in the same space of time, for three or four times the quantity of ground; and although, therefore, the practice is successful, yet we cannot but consider it as slovenly and wasteful, *conducted as it usually is, on most plantations.* There can be no doubt but that it can be so managed as to produce the best results with the least possible waste of manure, but to pen cattle on a piece of land, and to permit it to remain with all the dung and soil, saturated with the urine of the cattle, exposed to the influence of the sun and atmosphere, is, to say the least, injudicious. The better plan undoubtedly would be to plough the whole under and sow the seed as soon after the removal of the cattle as possible. But whatever may be said, either for or against this plan, it is not one which can be adopted in the garden, and should it be determined to sow the Turnips there, some other must be resorted to.

The Early Dutch, Six Weeks, and Stone Turnips, are as well cultivated on level surfaces, if not better, than on ridglets, but in England, the ridge system is preferred for the Norfolk, and other field varieties. Whatever course may be pursued, it will be best to use manure that is partly decomposed. The young Turnips require nourishment from the very first, and if this be scantily furnished them, (which must be the case if only long manure be used,) they will continue weak, perhaps be overcome by the weeds, and seldom produce a large crop. Should it be intended to cultivate them on a level surface, the manure should be first spread over the ground, ploughed under, and the surface made fine with the harrow. If the soil is clayey, it will require several ploughings to bring it to the requisite tilth, but this kind of soil is not to be recommended if any other

can be had—a sandy loam is perhaps the best, and the nearer the soil approaches to this, the better will it be fitted for the culture of this vegetable. If the ridge system be preferred, let furrows be run as near as possible to each other with the plough, the manure spread, and the earth formed into ridglets over it. On the level surface they may be sown either broad-cast or in drills, from twelve to eighteen inches apart; these drills can be expeditously made by using a piece of oak scantling of the requisite length, into which a number of teeth similar to those of a rake (only a little broader,) are inserted; a pair of shafts should be attached for the horse to draw by, which should be so made as to give it as little play as possible. Handles will also be necessary to enable the boy to keep it steady, and to take it out of the ground when turning. By this instrument a large number of drills may be made in a very short time—the seeds should be sown as soon after as possible.

But whether sown on a level surface or ridglets, broad-cast or in drills, care must be taken that the seeds be evenly and thinly scattered over the surface, and this can only be accomplished by using a very large quantity of dry ashes or sand, which separating the seeds, enables the sower to distribute them according to his wishes. If sown on ridglets the seed may be covered with a rake, or a number of twigs tied together in the form of a broom. If sown on a level surface, the harrow may be used for this purpose, taking care to fix a number of bushes underneath so as to raise it so high that the teeth may not enter the soil, at the same time let these be so thick as to pass over the whole surface: for the harrow is used now merely as a frame to fix the bushes or twigs to, and it is by these only that the covering ought to be done. Should there be a roller on the plantation, it ought to be passed over the ground, which will press the earth close to the seeds and cause them to vegetate much more regularly and earlier than they would otherwise do. If the seeds are fresh, the plants will appear in the course of a week, and as soon as they are large enough to be handled, they ought to be thinned out from four to six inches apart, which will be sufficient for the first thinning—as soon as they produce bulbs of one or two inches diameter, they may be again thinned to about twelve inches, at which distance they are finally to remain. The young Turnips now taken up can be used, and will be

found very delicate. The after culture consists in keeping them free from weeds, and the soil well pulverized—this can only be effected by the hoe, when sown broad-cast, when in drills, the space between can be cultivated with the two-tined cultivator, and the hoe only used around the plants, where it will be in requisition but for a short time. If sown on ridglets, the plough must be used, throwing the earth from the plants, and then returning it, as directed for cabbages. As to the time of sowing, we recommend that a few be sown in the month of August, for a first crop, but even these are in some measure precarious, and the main crop ought not to be put in before September; a successional one may be sown in October, and in case of necessity, even in November. If English seeds can be procured, let some be sown in December,* and they will furnish excellent and tender roots, when all others have become woody and unfit for the table. Those from English seed do not produce seed the first spring after, (if sown in December,) but when old will become woody and rot. Should Turnips be wanted late in the spring, some may be sown in February, March, and April, but later than this they will not succeed, and even April is rather late for them.

Ruta Baga.

The culture of this root does not differ materially from that recommended by us for cabbages. The ground should be put in good order by the plough and harrow, and furrows run from two to three feet apart—some have recommended greater distances, and Mr. Cobbet has even allowed four feet between the rows, but this distance does not appear to us to be necessary, and those recommended above will be found amply sufficient. Into these furrows the manure should be spread very thick, and the earth formed into ridglets over it, on which the seeds should be sown. We have cultivated them on level surfaces, and at less distances, but have never found them as luxuriant or succeed as well. Soon after the ground has been prepared as possible, the seeds should be sown. If it is intended to use the plants, which may be thinned out to fill up other compartments; they may be drilled along the whole length of the ridglets, but if they be not wanted for this purpose it will be a great

* These will require protection should there be any very cold weather, whilst they are young, especially when just coming up.

saving of seed to sow only a few every seven or nine inches, to be afterwards thinned out. Soon after they make their appearance it will be necessary to go over the ground, hoe the tops of the ridglets, and loosen the earth around them. A short time after, let the plough be used, running as near to the plants on each side as possible, throwing the earth from them, this will leave small beds or ridges of six or eight inches diameter. The hoe may now be used again, to destroy all weeds which have sprung up, and also to stir the soil around the plants. The earth should then be returned, by the plough, which will generally have the effect of destroying all weeds and grass which may have existed on the sides of the ridglets. This course of culture is to be pursued whenever the plants require working, with this addition, viz. that at every working, an additional furrow should be thrown to the sides, so as to increase the width of the ridges. As soon as the plants are large enough to handle they must be thinned out, unless wanted for the purpose of filling up vacancies or setting out into other places; in this case they may be left until they are from four to five inches high. It must be borne in mind, however, that the sooner they are thinned the better, for all plants are injured by being crowded even with their own species as well as by weeds.

It is not a usual practice among us to transplant the Ruta Baga for a crop, yet it has many considerations to recommend it to a favourable notice and adoption. In the first place, there is great saving of seed, (as almost every plant may be used,) in the second place, there is a greater certainty as to the time when a crop can be got in; and, thirdly, there is less labour in the attendance. These we know to be facts, and will, we think, be made apparent to all in the course of the observations we shall have occasion to make on this part of our subject. The usual, and perhaps the best time for sowing this crop, is from the last week in July to the beginning of September: during this time we have frequent showers, but these are seldom of long duration, and the succeeding days are generally clear, accompanied with great heat and a burning sun; hence it often happens that the seeds have to be sown several times before a regular crop can be obtained, the germinating qualities of the seeds being either destroyed, or the young plants killed soon after they are up. There is then at this period a great loss of both time, labour and seed. It is true that sometimes

there occurs a spell of rainy, cool weather, and if sown at this time there is every chance of succeeding. This occurs but seldom, and we are as seldom prepared for it when it does. But should we pursue the plan of either sowing on a seed bed, and treating them like cabbage plants, or preparing only a small piece of the ground intended for the crop, and on this sowing the seed tolerably thick, we can at a very short notice, prepare the ground and put in the seed, and should there follow a succession of hot dry days, we can, from the small space occupied, protect the plants, and if necessity be, even supply them with water, which, however, will rarely be necessary. Again, it sometimes happens that the season is unpropitious for the sowing of this crop. The prevalence of a drought at this time may wholly prevent it, or occasion it to be delayed so long that only a meagre crop can be expected. In this case the seed-bed can be resorted to, and at the time others are only sowing their seed, and with but little prospect of success, we can be transplanting out our crop in good season, and io time to arrive at full maturity, and of course yield a large product. To many this plan may apppear tedious, and requiring more labour than the sowing of the seed at once, on those spots where they are to remain, but this we are convinced is not so. Whenever the ground is to be occupied, whether it be with seed or plants the preparation must be the same; the labour, therefore, in this respect is equal. If the seed is sown at once where the plants are to remain, the whole surface must be worked over about every ten or fifteen days, until the plants shade the ground. In the seed-bed they will not require this attendance, and care if they did, the ground to be gone over is insignificant compared with the other. They will seldom be fit to be transplanted out under six weeks, so that two workings at least will be saved, and the labour of transplanting an acre is less than hoeing it, in the manner required for turnips.

Many may suppose that the product from an acre of transplanted Ruta Baga, is not equal to that from an acre on which the seed have been sown—the manuring and after culture of each being the same. But our own experience, and the experience of many of our friends with whom we have conversed, do not warrant us in coming to this conclusion; on the contrary, we have always found them fully equal, as far as we could judge from merely inspecting them;

and this is also the opinion of others. Some even affirm that they are earlier, and yield a greater product; this, however, is mere opinion, for no accurate experiment has been instituted, that we are aware of, in this country. This tends to show, however, that the product is not diminished.

In pursuing this course, the ground must be prepared in the same manner as recommended for sowing the seed, and no more should be prepared than can be finished in one or two days. It is best that all should be planted the same day that it is prepared, as the plants will take much more readily on newly prepared ground. The ridges being ready, select the strongest, and with a dibble insert them at twelve inches apart. Although this is an operation easily performed, and by which the transplantation is expeditiously executed, yet, except among gardeners, it is not generally understood—those who are acquainted with it will therefore pardon us for detailing what is so familiar to them. The dibble is a round piece of wood, about two inches diameter and fourteen long, made sharp and smooth at one end, (the handle of a spade, pointed, makes a very excellent one.) They are sometimes shod with iron to make them perform the work better, but when they are made smooth and of hard materials, this is not necessary.

Having the plant ready, proceed in the following manner: thrust the dibble down in an upright position, as deep as is necessary for the plant without doubling its roots; with the left hand insert it: placing the dibble about three inches off, and again thrust it down in a sloping direction, so that its point may arrive at, or a little below the point of the plant, force it now to an upright position with a sudden jerk, which will fill up the hole first made, and bring the roots of the plant in close contact with the earth; a slight stroke on the side of the bed fills up this. Some little dexterity, as well as force, must be used, so as to press the earth firmly around them. In order to know whether this be done efficiently, take hold of a leaf, if firmly set the piece will separate from the plant, but if the plant comes up, the earth has not been compressed around it sufficiently. In performing this operation, it is all-important that the earth should be pressed close to the points or ends of the roots of all plants, to insure their growth—it is not enough that it should be drawn around them at the surface, and it is owing to inat-

tention to this, that so many are constantly lost when set out. If the seeds are sown in August, the plants will be ready to be transplanted in September and October. It is seldom that we are troubled with much grass after those periods, and the plants themselves will soon overshadow the ground. Although there should not be weeds enough to make it necessary to work among the plants, yet the stirring of the soil ought not to be neglected; every operation of the kind is of immense value to the plants, as it not only prepares more food for them, but also loosens the earth, and enables them to push their roots in every direction in search of it, which, without this, would be out of their reach, and from which they would be as effectually cut off as if it had not been placed there. A small quantity of manure with frequent tillage, will produce a greater crop than a much larger supply with little or no tillage. Our limits will not permit us to discuss this point, but every planter who has been careful in his observations, must have witnessed this at some time or other in the course of his operations.

In ordinary seasons, those which are sown in August will produce roots sufficiently large for use in November, which will continue to increase in size during the winter, and remain good till late in the spring. We have said that August is the best month for sowing the seeds, should this have been omitted, or prevented by any cause, they may be sown in September, and perhaps even early in October, but these late sowings will not succeed so well. It is useless to sow any in the spring of the year, for they cannot withstand heat, but require cool weather to perfect themselves. Of the value of this crop in an agricultural point of view, we have said nothing, having confined ourselves to it as a crop for the plantation garden; but we cannot dismiss it without strongly recommending it to the notice and general cultivation of our planters, for the purpose of feeding their stock, for which they will find it well adapted, being very productive and highly nutricious.

Carrots, Parsnips, Beets, and Salsafy.

The culture of these being so similar, that that which is proper for the one, will answer for the others also. Being tap-rooted plants, they require a deep, rich soil, and if possible, such ought to be selected for them—if there be none such, it will be proper to sow the seeds on ridglets,

which having all the top soil collected together, affords an artificial depth, which will be found highly useful. It is best to sow these seeds on ground which has been highly manured for some other crop; fresh or long manure does not answer for them, especially if it be mixed generally with the soil: the effect is, that the roots will in most cases be small and forked. It sometimes however happens, that no such ground is vacant. In this case, let the compartment intended for the roots, be deeply ploughed, and trenches made; into these let *rotted* manure be spread, and the earth formed into ridges over this, as high as possible, and on these sow the seed. *Care should be taken that all the manure be buried at the bottom of the trench*, for should any mix with the soil, it may impede or divert the roots in their downward course. No fear need be entertained that too great an interval will be obtained between the tops of the ridges and the manure. If it be eighteen inches, it will not be one inch too much, for the young plants send their roots down to an almost incredible depth, in search of food, should nothing intervene to obstruct their progress, even before they are of the size of a quill. Should this plan be adopted, the course of culture recommended for the Ruta Baga should be followed, but if level surfaces be preferred, the two-tined cultivator may be used. It is important in the cultivation of these vegetables, that the soil should be kept pulverized to a considerable depth.

All of these vegetables may be sown for general winter crops in September, and with a greater chance of success than if sown earlier; should, however, a few be wanted, they may be sown in August, but must be protected from the sun. The beets, moreover, are liable to the attacks of the grub-worm, which prove very destructive at this season, and it is rare that many plants can be obtained from a planting in August. Should it, however, be successful roots may be obtained in November and December, and throughout the rest of the winter. Beets planted in September will be fit for use in January, and be very large and fine in the spring of the year. Another crop should be sown in February or March, and successional ones as late as May, but there is considerable difficulty in obtaining them from later plantings than these. We would recommend the turnip-rooted beet as decidedly the best adapted both to our soil, climate and the course of culture recommended by us.

Carrots should also be sown in September and October for general winter crops, and if protected whilst young, they may be sown at any time during the winter. The spring crops should be sown in February and March. If English seed can be obtained, this last sowing should be with them, as they will remain a year without running to seed, which is not the case with those raised from American seed. Parsnips and salsafy can be sown at any time in which carrots can, but parsnips do not withstand the heat quite as well, and therefore can seldom be procured in any perfection during summer. The treatment and culture is the same as that recommended for beets and carrots.

With one more remark we will close. All of these plants should be thinned out early. The carrots need not in the first instance be more than three inches apart, and when they have grown to the size of an half inch diameter, they may be again thinned, and those now drawn may be used. The same course may be pursued with the salsafy, but beets and parsnips require more room—they should be thinned out at once from eight to twelve inches distance. The turnip-rooted beet and the salsafy may be transplanted to fill up vacancies, or into new compartments, but the carrots and parsnips do not succeed well when transplanted.

(*To be continued.*)

ART. VI.—*Advice to persons spending the Summer and Fall in the Low Countries; by* Dr. JOSEPH JOHNSON.

Having selected a settlement in the pine land, as near to your field as may be consistent with health, the chief object is to have a house that will shelter you perfectly from rain—this will not be found difficult—the comforts and luxuries of life require much more preparation. The grass, weeds, and under-brush, if any, should be carefully cleared away, at all times of the year, but no tree should be cut down, or ditch made, for draining stagnant water after the middle of May. Your next object will be to avoid the dews and fogs before sunrise and after dark—these are invariably charged with the vapours most injurious to health at this season of the year. One very useful mode of dispersing such damp

vapours, is to have a fire made night and morning of brush or lightwood, so that the smoke may pass through your house. At this season of the year, when the pores of the skin are all open, nothing is more injurious to health than a sudden check to perspiration from exposure to a shower of rain or other accidental wetting, especially if obliged to set or lie still in your wet clothes—avoid this if possible, but as it cannot always be avoided, its ill effects may be in a great measure prevented by accustoming yourself to cold water and cleanliness; by having a pail of water thrown over your neck and shoulders either every night or morning. As you can scarcely avoid having your extremities chilled by the cold dews in passing through the grass and bushes, and the perspiration thus checked, even while the sun is beaming on the head and body with great heat; you should, if possible, wear thin flannel next to the skin, in pantaloons or drawers as well as shirts. Next to thin flannel, for this purpose, would be the use of cotton shirting, &c. The irregular determination of blood from the skin to the intestines and liver by such chilling causes, is a fruitful source of bilious diseases. Such effects may in a great measure be prevented by bathing your feet and hands, when chilled, in warm water, to bring back the natural warmth and circulation of blood in them, and putting on dry clothes immediately after your return from the field. The tea-kettle provided for your breakfast may enable you to do this without trouble or delay.

In the middle of the day the danger is not so great, but it is most prudent to avoid excessive heat, and occasional showers of rain, by using an umbrella. Sleeping in the grass or under a tree is very dangerous, for the air which occasions fall fevers is heavier than that of the atmosphere, and generally accumulates in such low situations.

Your diet should be plain, simple and plentiful, never eating to excess, so as to cause indigestion, but always eating enough to satisfy nature and appetite. That which agrees best with your stomach when taken in moderation, is the best food for you. The only restraint that I should recommend, would be against using fresh milk and cream as articles of food for an adult. When indisposed from any cause, your diet should be strictly guarded, even fasting at such a time may be useful and proper, although not proper when in health. Take a little cooling medicine to keep

the body regular, but not to debilitate; when more active medicine is required it should be prescribed by a physician—the mind of a man in high bilious fever, is generally too much confused for him to prescribe judiciously. When in good health no medicine should be taken at all, not even the mild tonic bitters that are usual: the idea of preventing sickness by taking medicine when in health is incorrect and injurious—it should be discountenanced.

The best drink both in sickness and in health, is good pure water, but where the use of spirits has been continued any time, it should be gradually reduced—occasional excess either in eating or drinking, is highly injurious, particularly at this season of the year, as it creates a feverish action in the blood vessels, and promotes an overflow of bile.

As a uniform, moderate degree of perspiration is in a great measure necessary to health, you should guard against its being checked by any imprudence or neglect. Among the most usual of these, is the habit of throwing off your coat when warm on entering the house, and placing yourself in the current of air, between doors and windows—likewise leaving your wet clothes to dry on you after wetting.

PART II.

REVIEW.

ART. I.—*On the Culture of the Grape, and making of Wine.*

1. *Extract from N. Herbemont, Esq. to a friend in Baltimore, dated August* 12, 1829. American Farmer, vol. ii. p. 371.

2. *Copy of an Answer to a Letter from a gentleman in Alabama, dated Columbia, So. Ca. July* 9, 1830, *by* N. HERBEMONT, Esq. Ibid, vol. xii. p. 147.

Should the culture of the grape and the making of wine ever become one of the permanent sources of revenue to the South, to no one will she be more indebted than to N. Herbemont, Esq. of this State—his persevering efforts to introduce the vine is deserving of all praise. Not discouraged by partial failures, or the luke-warmness of our citizens, he has progressed from year to year, not only in perfecting its culture and adapting it to our climate, but also in bringing this hitherto neglected subject into more favourable repute. And although he is not the first who has attempted the formation of a vineyard, yet as far as we are aware of, he is the first who has been successful in establishing one, and the very first who has succeeded in making wine. Many attempts were made to introduce the culture of foreign grapes into this and the neighbouring States, previous to this, with a view of establishing vineyards, for it was supposed that a country abounding with the wild grape, and whose temperature was so favourable to the growth of the vine, could not be otherwise than friendly to the establishment of vineyards, and the projectors appeared to labour under the delusions, that they had only to introduce the most approved varieties from Europe to follow the practices recommended there, and to reap the rich reward of their enterprize. How great, then, must have been their mortification to find that those which were esteemed the most there, altogether worthless here, that notwithstanding their strict adherence to all the rules of the vignerons, they could not succeed in getting a crop from their vines; that notwithstanding their severe pruning, the shoots would exceed all bounds, and that the fruit would rot. Most of these persons were mere adventurers, some of whom were under the necessity of seeking aid from our legislature. It was not therefore to be wondered

at that they should soon be discouraged and abandon an enterprize in which they were not seconded by our citizens, and seek for remuneration for their labours in the culture of those staples which we then enjoyed, and which so well repaid the cultivator. These attempts, and their subsequent abandonment, without being successful in a single instance, caused the subject to fall into disrepute, and he was deemed a visionary who thought of introducing the culture of the vine. So prevalent had become the opinion, that it was impossible to cultivate European varieties of grapes, that few if any attempts have been made to introduce them, even in sufficient quantities for our tables, and at this day we are not aware of more than two or three varieties which are now successfully cultivated in the neighbourhood of our city, and these not the finest that have been introduced into the United States. The cause of this is to be found in the little success which has attended our efforts to mature the fruit, and not in any failure to grow the vine, for every variety which has been introduced grows most luxuriantly, but the misfortune was that the berries about the time they were half formed, or just maturing, would rot, so that generally not more than a few scattering ones would be left, in many instances not one. For this there appeared to be no remedy, or rather none had been pointed out in foreign writers, and our citizens were not sufficiently interested to investigate the subject themselves. They followed the rules laid down, and when they found that they had an enemy to contend with, which was unknown to these authors, they found themselves unprovided with a remedy, and abandoned the contest. But their error consisted in adhering too faithfully to these authors, and in not varying their treatment so as to adapt it to our climate.

Fortunately for us at this period, Mr. Herbemont entered the lists. Well versed in all the authors who had treated on the vine, as well as the best practices of many of the districts of France, he was peculiarly well fitted for the enterprize. But he had serious difficulties to contend with. He had experiments to make and prejudices to remove—his firm ness and perseverance has enabled him to accomplish much, and although he has not been completely successful, yet having achieved so much, and being still unwearied in the pursuit, we have much to hope from him yet, and a few years more will in all probability enable him to triumph completely over those difficulties which have hitherto opposed his progress. The results of Mr. Herbemont's experiments—his experience and practice, have been embodied in the form of a treatise, which has been published in the first volume of this journal, and it is saying too much of it, when we give it as our opinion, that it is the best and most complete that has appeared in the United States, and of this many of our readers have an opportunity of judging.

The first letter which we notice, contains an account of his method of propagating the vine, and it is to call the attention of our readers to the ease with which this may be done, by engrafting them on the common wild vine, that we have introduced it here. On this subject Mr. Herbemont observes—

"To propagate the vine speedily and effectually, I would recommend grafting to those who have stocks fit for the purpose. In the country wild vines of any kind will do very well—even in the woods. Cleft grafting in the root, a few inches below the surface is the most convenient way; but when the stock is too large to be cleft, saw it off horizontally, and *with a gimblet make one or two holes in the stock about an inch and a half deep*, then take the scion, cut through the bark, and as much of the wood as may be necessary to fit it to the hole, and drive it in; then with a little well mixt clay cover the stock, and about an inch of the graft, and cover the whole with earth, leaving only one bud above the ground. The vine will bear grafting without joining the bark of the scion with that of the stock—the graft will grow with the utmost vigour, and frequently produce fruit the first year. They will at all events produce a number of fine cuttings the next winter. I have also succeeded well in making layers from side shoots, that grew very strongly near the ground, from the graft, laying them when green, in the summer following the grafting, and separating and transplanting the following spring. I have also dug up wild vines in the woods, even after they had begun to grow—in April *when they had leaves on;* grafted on them, and planted them carefully. I have *now* several of them grafted thus last April, that have *ripe fruit.* It is therefore advisable never to root up a vigorous vine because it does not bear good fruit, but to keep them for grafting. I have grafted last spring two or three hundred Madeira scions in the roots of the Isabella, (which is nearly worthless here,) and these grafts are now, many of them, with fruit on them, from twelve to twenty and even thirty feet long, and proportionably thick."

The second letter is valuable, as containing directions for the making of wine, and although this subject has been fully treated of by him in his Treatise, yet this extract will not, we trust, be unacceptable to our readers, at this time, especially as it contains some new information relative to the making of wine by the aid of sugar, when the juices does not contain a sufficiency of saccharine matter.

Omitting the first part of the letter, which contains merely a definition of what wine is, we extract all that it contains on the making of wine.

"In order, however, to make a sound, durable and wholesome wine, the grapes must have attained the highest degree of maturity possible; for, without this perfection of maturity, they contain but little saccharine matter, and this is essentially necessary. The produce of young vines is usually deficient in this, and to remedy the defect, it seems to me that the addition of sugar is allowable. Two other reasons have also induced me to add sugar to the grapes, without which a strong wine cannot be made, and unfortunately, our taste in this country has been vitiated by using, chiefly, particularly formerly, wines strengthened by considerable quantities of brandy. This practice of the wine manufacturers for the American market, has probably been introduced by the fear of the merchant, lest his wines should not be able to traverse the ocean without it, and be kept sound. Thus a very

injurious taste was acquired, to satisfy which the admixture of brandy was continued. The second reason is, that light and weak wines cannot be made and kept without good and deep cellars, in which little or no change of temperature is experienced; and I know, as yet, no such cellars in this country; and although they can easily be made, the expense is considerable, to which must be added all those necessarily unavoidable in new undertakings and numerous experiments.

I then added sugar to my *grapes* in proportion to the strength desired in the wine. The grapes, then, being as fully ripe as possible, my aim is to have them gathered in as short a time as possible, that the first gathered may not begin to ferment, while the others that are to be made into wine with them, are still in the vineyard. A number of hands proportioned to the quantity to be gathered in the course of one day, or two days at most, are to be procured. Each being provided with a pair of scissors and a basket, proceed to gather the grapes, taking care to cut off the rotton or the green berries that may be among the ripe and sound ones. As soon as gathered, they are to be mashed and bruised, so that not one berry, if possible, remains uncrushed, taking care, however, that the seeds be not broken, as this would give a harsh and bitter taste to the wine which nothing but age could cure, and that very imperfectly. As soon as the grapes are mashed, and before the fermentation has commenced, I try the juice with Beaume's 'Areometer' or 'Pese sirop,' to ascertain the quantity of saccharine matter it contains; which, let us suppose, is 8 or 10 degrees. I then add enough of the best dry, brown sugar, so as to raise the instrument, when immersed in the juice thus sugared, to 13 or 14 degrees, which, I think is fully sufficient to make a strong and durable wine. Those who have not this instrument may use a hen's egg which will rise in the must or juice, so as to have one end just out when a sufficient quantity of sugar has been added. The quantity I usually find necessary to add is from half a pound to one pound per gallon of juice, supposed to be contained in the vessel. This being done, and the whole in a vat not more than two-thirds full, I cover it with boards or cloth, and let it ferment in this state a shorter or longer time as the temperature of the air is more or less high. Thus, when the thermometer is from 80° to 90° or thereabouts, twenty-four hours I think fully sufficient; when 60° to 75°, two, three, or four days. At all events, I never wait until the crust formed by the skins and woody part of the bunches, and which rises to near the top of the vat, falls of its own accord. During this process of fermentation, I have the above named crust, called the 'chapeau' or 'cap,' broken and the whole contents of the vat well stirred and mixed about twice a day. After this, by opening the spigot at the bottom of the vat, I let out the juice as long as it will run. When there is no spigot or cock at the bottom of the vat, the purpose is answered by sinking a basket in the middle of it, and dipping the clear juice or must with a suitable vessel. Before it is put into the casks ready to receive it, it is proper to let the must pass through a wire seive to retain any seeds or skins that might be in it. The casks are then filled to about three or four inches of the bung-hole—but I am going too fast. The must that is thus left in the vat is then carried to the press, and the juice thus obtained, may either be mixed with the rest, or kept separately. When only a small quantity of wine is made, it is not worth while to keep them separate, although the must obtained from the press is somewhat inferior, being more harsh than that taken from the vat. The juice or must, being in casks not full by three, four, or five inches, according to their size, I take three or four grape leaves to cover the bung-hole, and keep them down by a double handful of moistened sand. As the fermentation goes on, these leaves and sand act as a valve which rises and falls as it is more or less violent. This continues two or three weeks, during which time the casks receive occasionally an addition of must, kept in smaller vessels for the purpose, filling them more and more as the fermentation subsides. When, by applying my ear to the cask, I no longer hear the bubbling or frying noise of fermentation, I take away the leaves and

sand, fill the casks to about one inch, and put a bung in the hole, without driving it very tight, and for greater security, it is necessary to bore a gimblet hole near the bung. This is stopped with a peg that can be taken out occasionally to let out the gas that has accumulated. Without this precaution, the cask, unless it was very strong, might burst. It is finally bunged very tight, and two or three months afterwards, taking advantage of a clear, frosty day, the wine, as it is now called, is racked off the first lees, and put into other and very clean casks duly prepared by being fumigated with a sulphur match. Wine made in this manner will keep any number of years perfectly sound and improving. The best I have ever make is the produce of a grape called here 'Madeira.' It is a very great bearer and a most juicy grape; but it has the disadvantage of being, in some situations, subject to rot, some years much, at other times scarcely at all, and sometimes not at all. When this last is the case, very great crops are made, and it is a very superior wine. It has hitherto commanded $2 per gallon, when four or five months old. It resembles Madeira, particularly that called the 'juice of the grape,' more than any other wine. It is very wholesome, agreeing well with both stomach and head, which last is never made to ache by it. This quality I chiefly attribute to its having no brandy in it. As for the notion that some persons entertain, that wine cannot be made without brandy, it is perfectly absurd. Distillation is comparatively a new invention, and I should like to know where our great ancestor *Noah* purchased brandy to make his wine with!—Cuttings and rooted plants of this Madeira vine, as also of many other kinds may be had here in considerable quantities at a very moderate price."

The rest of the letter contains a few remarks on several varieties of native grapes, which we would willingly give, but our extracts have already exceeded our limits.

SELECTIONS.

Art. II.—*On the Natural History of the Honey Bee, and on the Importance of its Products.*

[FROM THE NORTH-AMERICAN REVIEW.]

(Concluded from page 427.)

A young bee can be readily distinguished from an old one, by the greenish coloured down that covers it, and which it loses by the wear and tear of hard labour; and if the bee be not destroyed before the season is over, this down entirely disappears, and the ground work of the insect is seen, white or black. On a close examination, very few of these black or aged bees will be seen at the opening of the spring, as not having the stamina of those that are younger, they perish from inability to encounter the vicissitudes of winter.

Our seasons are very variable. The scorching droughts of summer, deny to plants their accustomed moisture; no honey, therefore, can be made by the bees at such times, and they are compelled to eat of their winter food. They cluster about the hive,

or deprived of their accustomed labour they are restless, and often intrude into a neighbouring hive, apparently for want of employment. In the summer of 1825, during the latter part of July, the heat was so distressing to the bees, the thermometer standing at 92° in the shade, that they seemed to have lost their usual instinct. A number of hives of the old fashioned patterns, that stood on a bench, were well filled with bees. At two o'clock, for three days in succession, the whole swarm of each hive rushed out and ran into the adjoining hive, where they remained for a few seconds, without apparent offence to the invaded bees, who in their turn flew madly out, and paid the same unceremonious visit to their neighbours. No quarrel ensued, nor a bee was killed by these irruptive movements. They seemed maddened by the heat; and yet the queen was left in the hive, for with all our attention to the sallying parties, we did not see a single queen among them. The same frenzy did not occur in those hives that were suspended upon joists, thus proving that the bees did not suffer so much from heat from those suspended hives, as they did in the flat-bottomed ones, that rested on a bench.

Our winters are equally disastrous to the poor bees. Of late years there have been so many mild days during the cold season, that a great deal of honey has been consumed. These alternations of torpor and animation cause greater exhaustion and loss of physical powers, than could be occasioned by a continuance of uniform torpor. This we infer from the fact that in Russia, where the winters are uniformly cold, bees do not perish; and in the West Indies, where there is perpetual verdure, they are never exhausted.

But although a bee may remain torpid to a certain extent for six months in the year without injury, in those climates to which the insect has long been accustomed, yet it would not exist for the same space of time in lower latitudes, where such a period of continued cold rarely occurs. Nature has not constructed them for every emergency. She has done no more for them in this particular than she has for man. They are compelled to get accustomed to a change of climate by degrees; not by alteration of the structure of their organs, for that can never occur under any circumstances, but by some change that takes place in the circulation of the fluids of the body, by which the system is accommodated to a higher or lower temperature.

If we are correct in this opinion, the suggestion of Dr Anderson would not be available in our climate. If, according to his proposal, bees were to be kept all winter in an ice-house, more causes than one would operate to the injury of their health, and consequently to the decrease of their number. The temperature of an ice-house, unless we are to suppose the hive to be buried in the ice itself, is much higher than that which is without the house. The torpor, therefore, would not be so complete as

to put a stop to the digestive process. The bees would be compelled to eat; and as their food is constantly in contact with the impure, stagnant air of an ice-house, it would soon be vitiated and engender diseases.

We know of but two diseases to which bees are subject in this country, and they have to our knowledge never occurred at any other season than the early part of the spring—dysentery and dyspepsia. The latter arises from the indolent inactive life, which they are *compelled* to lead, in our *variable* winters. The rule holds good with the most diminitive, as well as the greatest in animal life, that, "if we eat and wish to preserve health, we must work."

During the last winter, (1828,) the bees suffered more, and lost more of their number, than has often been known before. There was scarcely a day that they did not sally out to search for employment and food; but not being properly stimulated, they seldom returned to the hive. We frequently saw them crawling on the ground, weak and spiritless; and those that did return soon perished. On examining the hives, we observed that nearly all the honey was consumed, and many of the brood, that in ordinary seasons, are not hatched until the first part of April, assumed the fly form at an earlier period and died.

The cure of the disorder the bees take into their own hands. As soon as the flowers appear, they go to *work;* and then it is that they resort for aperients and tonics, which they abstract from the floors of the piggeries.

The other disease proceeds from long confinement in bad air, and from unwholesome food, and is invariably fatal; nor can the bees avert it by any instinct of their own. We know of no cure for the dysentery, when the bee is seized with it. Those that have it badly must die. We can restore those that are least affected, by frequently washing the hives as far as we can reach, with weak lye, and by ventilating them and removing the dead.

Much has been said of the danger to be apprehended from placing an apiary very near our own dwelling. There is indeed no positive advantage in having it too near; but as the person usually engaged in hiving the bees is occupied with farming affairs, and is not always present when the bees swarm, it is proper that the apiary should be within sight of the family. A bee certainly has frequently attacked a horse, and we have once or twice heard of one being stung to death. Considering the great number of hives of bees, it is really wonderful that more accidents of this kind have not occurred. But they are exceedingly rare; and when we know how many hundred horses annually die from the disease called the *botts*, which proceed from the maggots of the egg laid by the *horse bee* on the hair of the animal, the very few that suffer from the sting of the honey bee do not deserve to be taken into consideration. In every point of view, therefore,

it appears that bees should be cultivated. The wax that is consumed in this country, in various ways, is enormous, and most of it imported. If we may credit Huish, Great Britain imports from Germany and Italy upwards of £80,000 sterling of wax annually. We are unable to say with any precision, to what amount it is imported by us; but judging from the quantity that each family uses in a year, and the amount employed in various arts, it must be worthy of notice.

It is really disgraceful to such a country as ours to import wax or honey. We ought ourselves to export tons of it every year; and we trust, that in a few years this improvement will take place. Massachusetts and Connecticut are well situated, and abundantly supplied for proper food for bees, and their climate being less variable, is better adapted to their nature. We spoke of hills of twenty feet in height; this only applies to the site of an apiary near a dwelling. The dwelling itself may be on a hill. We have heard of convents situated on mountains that have been well stocked with hives. In short nothing is wanting but good pasture, good hives, cleanliness, and attention, to insure a rich reward to those who engage in the pursuit.

Children are naturally very fond of watching bees, and they would soon learn to take care of them, if they were not taught to fear them. All danger can be guarded against by making them wear woollen gloves that are long enough to draw over their sleeves at the wrist, and a wire cap to cover their head. They could thus be trained to manage bees; and training is quite as necessary to the full comprehension of the occupation, as it is in a trade of a carpenter or a shoemaker.

It would be unjust not to refer again to Mr. Butler's little book, after making it the occasion of expressing our own thoughts.—We shall rejoice if our slender notice of his work should encourage him to put forth a new edition; and we shall now take leave of the subject, although it be almost inexhaustible, by an anecdote that we have reserved for the conclusion, that it may make the deeper impression.

A good old French bishop, in paying his annual visit to his clergy was very much afflicted by the representations they made of their extreme poverty, and which the appearance of their houses and families corroborated. Whilst he was deploring the state of things which had reduced them to this sad condition, he arrived at the house of a curate, who, living amongst a poorer set of parishioners than any he had yet visited, would, he feared, be in a still more woful plight than the others. Contrary, however, to his expectations, he found appearances very much improved. Every thing about the house wore the aspect of comfort and plenty. The good bishop was amazed. "How is this, my friend?" said he—"you are the first that I have met with a cheerful face and a plentiful board. Have you any income indepen-

dent of your cure?" "Yes, sir," said the clergyman, "I have; my family would starve on the pittance I receive from the poor people that I instruct. Come with me into the garden, and I will show you the *stock* that yields me an excellent interest." On going into the garden, he showed the bishop a large range of bee hives. "There is the bank from which I draw an annual dividend. It never stops payment." Ever after that memorable visit, when any of the clergy complained to the bishop of poverty, he would say to them, "keep bees, keep bees;" and we shall bid our readers adieu with the same advice.

ART. II.—*Outlines of Horticultural Chemistry:—Vegetable Physiology.* By G. W. JOHNSON, Esq. Great Totham, Essex.

[FROM THE GARDENERS' MAGAZINE.]

(Continued from page 271.)

IF kept perfectly dry, seeds will never vegetate. They require, therefore, some kind of moisture, and that moisture must be supplied by *water*. I have kept beans and peas moistened by olive oil and alcohol only, but otherwise under circumstances favourable to vegetation, without their showing the least symptom of germinating. Water, then, is an essential; the most appropriate quantity varies with the species of the plant. If in excess it is more prejudicial than a total deficiency, since in the first case it excites decay, in the latter event the seed remains unaltered. That the first ever occurs in practice, arises from the faulty cultivation of the soil; for, if properly drained, however retentive it may be, no natural disposition of moisture is ever too abundant or continuous. Some seeds, as those of aquatics, succeed only when completely immersed in water; others, as those of the lemon, will often germinate with the unassisted moisture of their own pericarp.

All seeds require a certain degree of *heat;* none will germinate at a temperature so low as that of freezing water, yet the greatest degree of cold is not injurious to them, if germination has not commenced. Every seed appears to vary in the degree of heat which it requires before vegetation commences, though an increase above such a temperature, if not excessive, always accelerates the progress. Adanson found that seeds which naturally do not germinate in a less space of time than twelve hours, may, by an increase of heat, be made to do so in three hours. Seeds ripen in high latitudes, or at great heights, and consequently in a climate where average temperature is much

lower than that of countries nearer the equator or of less elevation above the sea, germinate much more quickly when sown in these latter climates, than if resown where they were produced; a fact which defies explanation, if plants are devoid of sensation.

The experiments of Ingenhouse and Sennebier evince that *light* retards germination; and some which were tried under my own inspection afforded confirmatory results. This fact has long been practically acknowledged, by the cultivators of the soil burying their seed beneath its surface.

These facts hold out some beacons worthy of being attended to, as guides for the operation of sowing. They point out that every kind of seed has a particular depth below the surface, at which it germinates most vigorously, as securing to it the most appropriate degree of moisture, of oxygen gas, and of warmth. From a quarter of an inch to two inches beneath the surface, appears to be the limits for the seeds of plants usually the objects of cultivation; these, however, must vary for the same seeds in different grounds and countries. It must be the least in aluminous soils and dry climates. Sowing should in general be performed in dry weather, especially on heavy soils, not only because of the greater saving of labour, but because it prevents the seed being enveloped with a coat of earth impermeable by the air, "which," says Sir H. Davy, "is one cause of the unprodutiveness of cold, clayey soils." Perhaps the time at which any ground may be *raked* with the greatest facility, is as good a practical criterion as any, to judge when it is most fit for sowing. In general, if clay does not predominate in its constitution, a soil rakes best just after it has been turned up with the spade. If clay does predominate, it usually rakes with most facility after it has been dug two or three days, and then immediately after a gentle rain. But it is certain that the sooner seed is sown after the soil is dug for its reception, the earlier it germinates. In the droughts of summer, water is often required to newly sown beds. Such application must not be very limited or transitory; for, if the soil is only moistened at the immediate time of sowing, it induces the projection of the radicle, which, in very parching weather, and in clayey caking soil, I have known wither away, and the crop be consequently lost from the want of a continued supply of moisture.

From the slight sketch contained in the foregoing papers, it will have been seen that plants derive their whole nourishment from the air and soil. It is of importance to know how the constituents of these may be ascertained, so as to enable us to judge beforehand whether they hold out a prospect of affording a plentiful increase to the cultivator.

Experiments on the constituents of atmospheric air, are never required by the tiller of the ground; for it has been demonstrated by the best chemists that its composition is invariably the same

in all parts of the globe, and whether obtained from a level with the sea, or from the greatest height to which man has found means to ascend. Their researches afford one general result, which is, that the atmosphere is composed of twenty-one parts oxygen, and seventy-nine parts nitrogen, with the admixture of about one part of carbonic acid gas in every thousand of its parts.

This simplicity of composition is very far from existing in soils; of them, perhaps, no two specimens in the world are precisely alike.

Before I proceed to detail the mode of analyzing a soil which I employ, and for which mode I was originally indebted to the *Elements of Experimental Chemistry* by Dr. Henry, I must pause to animadvert upon two common prejudices, each of them the offspring of ignorance.

The first prejudice is, that which argues that chemistry is of no use to the cultivator of the soil. I slightly touched upon this in my opening paper, and the effect of Lavoisier's practice directed as it was by science, is an introvertible argument against this prejudice, for facts are not to be overturned by obstinacy; but I am induced to argue the point more in detail, by having heard such an objection raised by a person whom I have been accustomed to consider possessed of a liberal mind.

We have seen that every plant has a particular temperature in which it thrives best; a particular modification of food, a particular intensity of light, and that these particularities vary again at different periods of their growth. It is equally certain that they are subject, like all other matter, to various influences, (the application of some substances corrodes them;) nor are these uniform. Acids are injurious to some plants, alkalies to others, &c.; the excess of some of their constituents, and the deficiency of others, insure disease to the plants in which such irregularities occur; disease is accompanied by decay, more or less extensive and rapid, and ultimately death ensuing, each plant is reduced into its proximate elements. Now, if it were possible for any science to teach the cultivator of plants, how to provide for them all the favourable contingencies, all the appropriate necessaries above alluded to, and to protect them from all those which are noxious to them, the art of cultivation would be far advanced to perfection; yet such a science is chemistry.

I do not mean to advance that chemistry, as at present known, is capable of supplying all the desiderati I have alluded to, but it can many of them. Besides chemistry has not reached its present state in a day; it has been the work of ages, and is daily improving; neither has it been the creation of one mind, but has been the gradual structure of many intellectual labourers, from the days of the Arab alchemists until now. Let it not then be supposed, that the cultivator of the soil should wait for others to

make discoveries, and that he need only take advantage of them. Should the physician be ignorant of pharmacy, and, confining himself merely to detect diseases, leave to the pharmaceutist to point out appropriate remedies? As absurd would it be to assert that, though chemistry is one of the best aids of horticulture, the gardener should leave its application to others. I shall conclude my observations on this point with two extracts, one from the pen of Dr. Henry, the second from that of Mr. Kirwin "Any knowledge," says Henry, "that can be acquired respecting soils and manures, without the aid of chemistry, must be vague and indistinct, and can neither enable its possessor to produce an intended effect with certainty, or to communicate it to others in language sufficiently intelligible. Thus we are told by Mr. Arthur Young, that, in some parts of England, any loose clay is called marl; in others marl is called chalk; and others clay is called loam. From so confused an application of terms, all general benefits of experience in agriculture must be greatly limited. Chemistry may, to agriculturists, become a universal language, in which the facts that are observed in their art, may be so clothed, as to be intelligible to all ages and nations."

If it were true, which it is not, that the cultivation of the soil has not improved during the last two thousand years, though some have argued for such an untenable opinion yet supposing it to be true, such an argument *ex ignorantiâ* would avail nothing against the possibility of improvement. Does not every cultivator of the soil know that some ground will grow luxuriant crops, such as a second piece of ground, though manured without limit, will never equal? All that he can say is, that "the *ground* does not *like* those crops;" but the chemist can teach what constituents are deficient, what noxious ones are present, which, in less correct language, causes the *crops* not to *like* the soil. I am perfectly willing to grant, and to lament that facts justify the admission, that chemistry has not been brought to the illustration of the agricultural arts so successfully as to many of the arts of manufacture; this is in a chief degree owing to the insensibility of cultivators in general, but not entirely so. It partly arises from the great difficulty and intricacy of vegetable chemistry; "if the exact connexion of effects with their causes," says Kirwin, "has not been so fully and extensively traced in this as in other subjects, we must attribute it to the peculiar difficulty of the investigation. In other subjects, exposed to the joint operation of many causes, the effect of each, singly and exclusively taken, may be particularly examined, and the experimenter may work in his laboratory, with the object always in his view; but the secret processes of vegetation take place in the dark, exposed to the various and undeterminable influences of the atmosphere, and require, at least, half a year for their completion." But such difficulties are only so many powerful reasons for increasing the labourers

in this field of science; and when these have gone on collecting observations and facts, some master mind will arise, in an age perhaps not very distant, and render the whole more luminious, by arranging them in the magic order of system.

The second prejudice to which I shall advert, is that which considers chemical experiments cannot to be tried without expensive apparatus, a prejudice to the full as futile and baseless as the preceding. To demonstrate this, but one fact need be stated. The late Dr. Henry of Manchester, whose experiments were so numerous and so varied, so intricate and yet so accurate, "was at no period of his life in possession of a well furnished laboratory, or of nice and delicate instruments of analysis and research;" but his ingenuity "was especially displayed in the neatness and success with which he adapted to the purposes of experiment, the simple implements that chance threw in his way." (*Quarterly Journal of Science*, &c. vol. viii. p. 17.) If to make experiments in nearly the whole range of chemistry required no paraphanalia of apparatus, much less does it require such for the analysis of soils, to which I shall in this place confine my directions for the attention of the horticulturist; not that such alone is desirable to be pursued by him, but because, in the present state of chemical knowledge among the cultivators of the soil generally, it is absurd to expect that he would pursue some of its most intricate researches. There is no field of science in which lie hid at present more brilliant objects for examination, none that will redound more to the fame of their discoverer, none that will be more generally beneficial to mankind, than that which embraces agricultural and horticultural chemistry. It is yet in its infancy, but the day will come when every cultivator will prepare his soil for each crop, in a more scientific way than at present manifested in one unvarying course of culture. The day will come when manures will be distributed in greater variety and with more discrimniation than stable manure and chalk are at present by the load; and when science confirming him in the judicious application of manures, and the necessity of a clean course of cultivation, will, at the same time, demonstrate that even dungs and composts may be selected and compounded with beneficial discrimination; that economy is not misplaced in regulating abundance; and that, though chemistry can never supercede the use of the dung hill, the spade, the plough, and the hoe, yet it can be one of their best guides, can aid them in their objects, can be a pilot even to the best practitioner.

(To be continued.)

ART. III.—*Specification of a patent for a process or method of purifying, tempering, and preparing the Juice of the Cane, cultivated and grown in the United States, and rendering it better fit to be converted into the Sugar than has hitherto been done. Granted to* AUGUSTUS ARCHBALD, *Sugar Refiner, of the City of New-York, April* 19, 1830.

[FROM THE JOURNAL OF THE FRANKLIN INSTITUTE.]

This discovery, application, or invention, consists, *first*, in neutralizing the juice, that is to say, rendering it perfectly free from acidity, without allowing lime, or any other alkali, that may be used, to predominate. *Secondly*, in precipitating the impurities, and thereby admitting of its being converted into sugar, with little or no skimming. *Thirdly*, in imparting to the juice the color, or hue that may be desirable for brown sugar.

For carrying into effect this my said improvement, I do operate as follows, that is to say, I do collect in one or more wooden or other vessels, the juice running from the mill; the aforesaid vessel or vessels, being arranged, and fitted in the interior with a copper pipe, circulating round the bottom, which may or may not be perforated with holes, as may be deemed most convenient, and so fitted with cocks, and connected with the steam generator, as to allow of the steam being let on and turned off at pleasure; the mode of arranging which pipe, will be understood by any engineer or coppersmith. The receivers being sufficiently full, I do proceed to purify the juice, and prepare it for being converted into sugar in the manner following. I do mix well with the juice a certain portion of the mixture composed of lime and alum, called *finings*. I do apply the aforesaid mixture in the proportion of two pounds, or thereabouts, to every hundred gallons of juice, the mixture being well stirred with the juice. I do throw in, and stir well with the juice, small portions of good well slacked lime, made perfectly fine before applying it, or any other alkali, (preferring lime, as being most economical,) and I do continue to add the same, until the test paper, or any other test that may be used to show the presence of acid, no longer changes colour. I do then examine the juice with the test paper, or any other test showing the presence of lime, to ascertain whether I have given an excess of lime, or other alkali, in which case I do let in more fresh juice, in order to neutralize the excess of lime. Having by this first operation ascertained exactly the quantity of lime requisite to temper or neutralize a given quantity of juice, in all subsequent operations, I do throw in at once the full proportion of lime, and mix it well with the juice, before heating it. The juice being thus perfectly freed from acidity, I do turn on the steam, and heat it nearly to the boiling point, or make it so hot that the hand cannot be dipped into it

without the danger of scalding. I do then stop the steam, and immediately throw into the juice, and mix well with it, a further portion of the aforesaid mixture, made thin with water, which portion will be determined by observing in a tumbler, or other glass vessel, the rapidity with which the impurities of the juice precipitate; a sufficiency being applied, the juice is allowed to remain till the impurities settle, when the clear liquor is draw into the evaporators, to be converted into sirop, or sugar, and the residue, or sediment, into another receiver, where it is mixed with a small quantity of hot water, and a small portion of lime, and allowed to settle, when the clear part is drawn off, and converted into sugar with the rest of the juice. Should it be desirable to impart a lighter colour to the aforesaid juice, I do then increase the proportion of the aforesaid mixture, after stopping the steam, to allow the juice to settle as aforesaid, and I do declare that it is not indispensable to use the aforesaid finings, as the cane juice can be purified, though but very partially, with lime, or any other alkali alone, but the sugar therefrom has a tendency to turn gray, a colour always fatal to it in the grocer's market; besides, the impurities precipitate with difficulty, and the juice is dark.

I have discovered that finings applied to the cane juice as aforesaid, purifies the juice much more perfectly, hastens very considerably the precipitation of the impurities, and imparts to it, which is communicated to the sugar, that beautiful straw orange colour so much admired and desired in brown sugar; and, what is of no less importance, renders the molasses drained from the sugar made from juice that had been treated with it, much more pure and fit to be converted into sugar than it would otherwise be. It has been ascertained that by purifying the cane juice, and precipitating the impurities by the method aforesaid, a very large increase of sugar can be obtained, from a given quantity of cane, beyond what can be attracted when treated by the ordinary process of tempering and skimming.

The difference between my method of treating and preparing cane juice, and that generally used, consists in my precipitating the impurities thereof, whereas the impurities of the juice have hitherto been got rid of, and that very imperfectly, by skimming. My mode of tempering differs also materially from that usually followed. By my method the exact quantity of lime required by the juice, to correct the acidity therein contained, is applied with ease and precision, and the most ordinary negro, or even boy, may in a few hours be taught to temper with the greatest correctness; whereas by the method of tempering generally pursued, it requires years of experience, and the most intelligent person; and even then it cannot be done with any kind of certainty, as sometimes too much lime is given, which makes the sugar dark, and at others too little, in which case it granulates

badly, consequently a large quantity of molasses is produced, and it drains with great difficulty. And with regard to the aforesaid mixture of lime and alum, or saturation of lime and alum, called finings, although I do not claim to have invented that compound, it having been long known; having discovered the important and valuable effects produced by it upon cane juice, I do mean to apply for letters patent to entitle me to the exclusive right to the application of the same to cane juice, for the purposes for which I employ it.

I will now proceed to state the method of preparing the aforesaid mixture called finings, which is as follows: a quantity of alum is melted either in a wooden or copper vessel, with its own weight of water or thereabouts. A quantity of good well slacked lime, mixed with water sufficiently thin to allow the gross particles, or the lime that has not dissolved, to subside, leaving a kind of milk or lime, or very strong lime and water; this lime is then added to the alum, till the test paper showing acidity, changes colour no longer.

The test paper showing the presence of lime is then tried, to ascertain that lime does not predominate, the mixture being made perfectly neuter is then thrown upon a strainer, and allowed to drain off the water, when it is fit for use.

My invention, or improvement, upon which I claim in these my letters patent, an exclusive privilege, consists in this, my process, or method, herein specified, of purifying and preparing the juice of the cane grown or cultivated in the United States, intended to be converted into sirop or sugar.

W. A. ARCHBALD.

ART. IV.—*Experiments to ascertain the comparative advantages of preparing and using by various processes, and in different forms, several kinds of grain, &c. for food for hogs, cattle, &c.*

[Communicated to the Trustees of the Maryland Agricultural Society, and by them ordered to be published in the American Farmer.]

Indian Corn.—Five ounces of corn, (avoirdupois,) just shelled from the ear, were put into a pound and a quarter of boiling water, and boiled for ten hours. As the boiling evaporated the water, the vessel was filled up with half a pound of water as often as appeared necessary. Six pounds two ounces of water were used; and when the boiling was done, there were eight ounces of liquor, five of which were thick and rich, drained from the corn. Thus drained, and brought to the state of hominy tolerably well cooked, the mess was found to weigh fifteen ounces.

This experiment was made with two views: 1st, to find what would be the increase of weight; and, 2dly, whether the process of boiling would not produce every desirable effect, without the trouble and expense of having the corn ground into meal.

Corn Meal.—Five ounces of unsifted corn meal were mixed with one pound ten ounces of scalding water. Before it had boiled long, fearing it might burn, one pound ten ounces more of water were added. The meal was well cooked in one hour; but the mess being thinner than was wished, the boiling was continued for some time to evaporate the water, but the meal appeared to hold the water by a powerful attraction, and parted with it very slowly. When the process was stopped, the mixture was thinner than mush, or hasty pudding; but rather thicker than gruel, and was in an excellent state to give to a sow suckling a farrow of pigs. The mess was again put into the scales, and the five ounces of meal were now found to weigh over thirty ounces.

The meal may be cooked with one-fifth of the fuel necessary to cook corn.

Lady Peas.—Five ounces of lady peas were next cooked. The mess when thoroughly done and drained, weighed fifteen ounces; but they yielded no rich liquor, and appeared like a very inferior food to boiled corn.

Rye.—Five ounces of rye were put into one pound ten ounces of boiling water, and the boiling was continued for five hours, in the course of which one pound more of water was added. The mess was now thoroughly done, and was enveloped in a rich looking gelatinous substance, of which only two ounces would drain off. This mess, which had every appearance of rich, nourishing food, weighed twenty-three ounces, beside the two ounces of jelly.

Rye Shorts.—Five ounces rye shorts were mingled with one pound ten ounces of boiling water. They were boiled very gently for two and a half hours; in the course of which time fourteen ounces more of water were added. It was now a thick, rich gruel, and apparently in a nice state for a mess for a milch cow. In this state it weighed forty ounces.

Flax Seed.—Five ounces of flax seed were next placed on the coals in one pound ten ounces of water, and twelve ounces more water were added. This mess was very easily excited, and the oil boiled over more than once. What was saved made a very rich looking mess of twenty-five ounces. But nothing need be said in favour of flax seed jelly—those who have used it, place it even before corn meal for fattening beaves.

Wheat Shorts.---Five ounces of good wheat shorts were cooked in one pound ten ounces of water, with the addition of eight ounces more during the boiling. When done the mess looked like a rich loblolly, and weighed thirty-one ounces.

In all these experiments, that the increase of both bulk and weight was caused and made by the water, aided by the agency of heat, there can be no doubt. And when it is considered that water is the greatest ingredient in the richest made soups; and is the chief agent in the growth not only of herbs and plants, but of the huge oaks of the forest, why may it not in an absorbed and solid state conduce to the growth and increase of a hog?

Corn Crushed—(to ascertain the yield.)—A tub of five bushels of corn in the ear was shelled, and yielded two and a half bushels and one quart. The cobs were pounded and again mixed with the corn. In this state the whole was ground, and reduced to a fine chop. It now yielded by measure four and a half bushels, wanting one quart.

If the eighty-one quarts of corn had been ground into tolerable meal, they would have yielded by measure one hundred and five quarts of meal; and with the cobs added did make one hundred and forty-three quarts of fine chop. I regret that the different items of this experiment were not weighed as well as measured.

Fattening Hogs.---On the first day of December, 1824, four shoats of the same breed, nearly of the same size, and as much alike in every respect as could be selected from a herd of ninety odd hogs, were made choice of; each carefully weighed, and placed in a separate stye, where their food could be exactly regulated. They weighed between eighty-one pounds and a hundred. The two, whose weights together made 185 pounds, were fed on one gallon of shelled Indian corn, weighing seven pounds, to each, for every twenty-four hours, and as much water as they wanted. This quality of food was a plenty for them; generally they about consumed it. Some five or six different days between the first of December and the 4th January, the time the experiment was going on, they did not quite eat their whole allowance.

To the two shoats, whose weights together made 173 pounds, seven pounds of good Indian corn meal, measure by ten pints, were made into good mush, or hasty pudding, and divided between them for every twenty-four hours. That is, these two had allowed them exactly half the weight of meal, which the others had of raw corn. The seven pounds of meal were daily mixed with scalding water, and then well boiled: the whole process of cooking was done on an average in one and a half hours. They were all fed twice a day, and at the same time. The evening feed of the shoats fed on mush was generally warm---the morning feed having stood all night, was always cold. The seven pounds, or ten pints, of meal, when cooked, weighed an average of thirty pounds, and measured an average of three gallons. There was a difference of nine pounds in the weight of the latter pair; the smallest had the least appetite, and his allowance of fifteen pounds of mush was just as much as he appeared to want,

or would eat up clear; the other was greedy, and always sharp set---dispatched his mess quickly, and wanted more.

Before the experiment had progressed a fortnight, there was a very perceptible difference in the appearance of these pigs. Those fed on the mush assumed a more thrifty, healthy, fresh appearance, particularly of their hair, and this difference became more striking, as the experiment advanced.

On the 4th January, 1825, while preparations were making for killing and dressing, they were again carefully weighed on the hoof. One of those, whose daily allowance had been seven pounds of corn each, had increased twenty pounds in thirty-four days; the other, who had had an equal allowance of corn had increased only five pounds. I could not account for this difference by any thing I could discover either before or after killing; the appetites of these two were much more alike than of the others, and their health was apparently equally good.

Of the pair fed on mush, whose daily allowance had been three and a half pounds of meal each, the greedy one had gained twenty-three pounds, and the other twenty-one pounds.

These are all the material facts in these experiments, except that a very small portion of salt was put into each mess of mush, *and there is no miracle in them.** The hogs, allowed three and a half pounds of meal each, gained less than three-fourths of a pound daily, and this surely they might have gained from the meal; but they gained more than those fed on double that quantity of corn. The saving of one-half the immense quantity of corn consumed in raising and fattening hogs in Maryland, would be well worth the offer of a premium to have these experiments accurately repeated and tested by different persons.

ART. VII.—*Observations on the means of preventing and relieving the accidents and diseases, to which farmers are particularly subject; by* JAMES MEASE, M. D.

[From Memoirs of the Philadelphia Agricultural Society.]

(Continued from page 444.)

Dysentery.—This is a very serious complaint, and deserves particular consideration, inasmuch as it is not like many other diseases, confined to one person, but often prevails as an epidemic through a country town, township or county. Scarcely a

* The water may be denied all credit, if you please, except that of a diluent and digestion.

year passes without the newspapers announcing its prevalence in some part of the United States. The particular symptoms which mark the disease, are frequent calls to stool, with trifling but bloody discharges, attended with great pain in the bowels and loins, and slight fever. The first point to be attended to, is to open the bowels thoroughly, by mild purgatives. Epsom or Glauber's salts, and for children, magnesia is to be preferred. An ounce of either of the two first, dissolved in a pint of hot water, to which a grain of tartar emetic should be added, may be taken at two doses, in the course of an hour. They should be worked off with thin gruel of corn-meal. A prejudice prevails among some physicians, and with people generally, in favour of castor oil, as a purgative in this disease, but ample experience warrants me in saying, that it is not supported by fact. This prejudice is grounded upon the supposition, that the oil will sheath the tender and inflamed coats of the intestines, as well as open the bowels: but there is more reason to believe, that the febrile state of the intestines, and the acrimonious nature of their contents, will render the oil rancid, and cause it to prove a source of irritation and increase of disease. It has occurred to me to know of the deaths of several persons by the dysentery, in the year 1816, in Philadelphia, all of whom took repeated does of castor oil. The safety of the neutral salts, has been sanctioned by the practice of the most eminent physicians; exclusively of their purgative property, they are proper from their sedative operation. If the pain in the bowels be severe, and headach and fever attend, twelve ounces of blood should be taken away from a grown person, and a proportional quantity from a youth. Injections of warm water, in which a portion of starch has been mixed, and a tea-spoon or two of laudanum, will ease the pain in the bowels. Equal parts of laudanum and sweet oil should be rubbed on the belly, and perspiration promoted by covering it with flannel, by laying in bed, and drinking freely of rice-water, in which a stick of cinnamon has been boiled. If it be possible to obtain the inner bark of the slippery elm, it should be infused in water, and the mucilage taken freely and frequently. No article in the materia medica equals this as a demulcent, and its speedy operation in affording relief to the pain in the bowels, in dysentery, has been amply tested. An infusion of the leaves of the bêne plant,* has also been used with signal success. If the pain continue violent after the bowels have been well opened, a blister to the belly will seldom fail of relief. In this stage, twenty, thirty, or forty drops of laudanum, may be given at night, if sleep cannot be obtained without it.

The salts or magnesia must be repeated, at least every other day, during the continuance of the bloody discharges. When

* *Sesamum orientale.* See my account of this remedy in the dysentery. Coxe's Med. Museum, vol. ii. p. 159. Philad. 1806.

they have ceased, and a simple diarrhœa or lax remains, it may be gradually checked by the use of laudanum at night, and a teaspoonful of burnt brandy and white sugar, taken frequently in the course of the day. The diet in this disease, must consist of the mildest and most bland food, as arrow-root jelly, jelly of calves feet, without wine; or, of flour boiled hard, grated, and then boiled in milk with cinnamon, and sweetened with loaf sugar. The utmost attention to cleanliness, in this disease, is indispensable. Nothing offensive must be allowed to remain a minute in the sick room: the sheets, linen, and bed clothes, are to be daily changed, and thin lime-wash kept in the chamber.

In very obstinate, protracted cases, it is necessary to touch the mouth with mercury. For this purpose two grains of calomel may be given, night and morning, with ten drops of laudanum, until the desired effect be produced. The disease vanishes soon after the mouth becomes sore. But the remedy is not proper in the early state of the complaint.

When the disease is epidemic, in a town or district, it may be often prevented, by taking an occasional dose of epsom salts or magnesia; by great attention to diet, avoiding unripe fruit and cucumbers, and unnecessary exposure to the night air, the hot sun, or to alternations of heat and cold. The dysentery is not necessarily contagious, but may become so, by inattention to cleanliness. When the disease prevails therefore in a vicinity, all intercourse with the sick, beyond what is required by the calls of humanity should be avoided: the idle night gossiping of servants must be strictly prohibited. Advice respecting cleanliness, when it can with propriety be given, may prevent the spreading of the disease.

The diarrhœa, which often follows dysentery, may be cured by taking *a weak* watery infusion of the roots of the blackberry or dewberry shrub.

Concussions of the Brain and Strokes on the Head.—Require the loss of more or less blood, in proportion to the degree of injury received, and the age, habits, and constitution of the person injured. The sooner it is taken away, after the accident has happened the better. The person should be bled if possible, while sitting or standing up, so as to induce a faintness, and thus save the loss of an unnecessary quantity of blood. A purge of Glauber's or epsom salts, or castor oil should also be given, entire abstinence enjoined for one or two days, and then the least quantity of liquid vegetable food, for two weeks is to be taken. Rest and silence are essential. As serious complaints have occurred, after an interval of between ten and sixty days, from a blow on the head, great attention should be paid, not to excite the system to the production of the morbid state, to which it is predisposed from the accident. The same remarks will apply to falls.

Sprains.—When a limb has been sprained, and the accident happens at a distance from home, the sufferer should, if possible, be conveyed home in a carriage of some sort; the part is then to be bathed in cold water, and kept in a horizontal position. If much inflammation attend, leeches should be applied. The most absolute rest is necessary to a cure, and the sufferer must make up his mind to endure the confinement, unless he prefers a stiff joint, or to risk a fall and increase of the complaint, by walking before he ought to put his foot to the ground. Even walking up and down stairs, to and from bed must be avoided. After the inflammation and swelling have subsided, the part must be gently rubbed with the hand, upon which a few drops of sweet oil have been dropped, for ten minutes, three times a day: the good effects of friction in removing the rigidity of a part are slow, but certain. Bathing the part with warm water occasionally, before rubbing it, will assist in relaxing the muscles and tendons. After a severe sprain of the ancle, a laced boot should be worn to give a mechanical support to the joint.

Sore Lips.—The febrile state excited in the system by the heat of the weather, the stimulating food and strong drink, so freely consumed during harvest and summer, are the causes of this complaint, which is very painful, and often continues for weeks. Sometimes the cuticle of the lips will entirely peel off. The means of cure are, first, a purge of an ounce, or half an ounce of Glauber's or epsom salts, or the same quantity of castor oil, a vegetable diet for a few days, and a total abstinence from salt meat. The lips may be bathed three or four times daily with clear lead water, in the proportion of twenty grains to a pint of rain or spring water, and then covered with a soft linen rag smeared over with an ointment, composed of bees wax and sweet oil, or fresh hogs' lard. If pain attend the removal of the rag, the water may be applied without taking it off. A much neater application is gold-beaters' skin with which the lips should be covered, after using the lead water, and permitted to remain on.*

(To be continued.)

* The gold-beaters' skin, must be applied dry; if moistened, it crumples and cannot be made to lie smooth. The part to which it is applied, is first to be wetted, and the skin then laid on, having previously slit the edges to accommodate it to the lips.

PART III.

MISCELLANEOUS INTELLIGENCE.

Cow Cabbage.—This variety of the cabbage tribe is attracting considerable notice at present. It is described as attaining "an altitude of from twelve to sixteen feet, or even more, and is so productive that sixty plants afford sufficient provender for one cow for a year, and as the side shoots only are used, it last four years without fresh planting." It has been introduced into England from France, and lately into the United States. The reports of those who have cultivated it among us, are not as favourable as those from Europe. In Jersey were it is much cultivated, the farmers pluck off the leaves and feed them away to their stock, leaving a small bunch or head at the top. The stalks are strong and used for roofing small buildings. A correspondent of the Gardener's Magazine, speaking of the Anjou cabbage, (which he supposes to be the same as the cow cabbage,) says—"About 1770, there was a variety of cabbage in cultivation here, called the Anjou cabbage, which I take to be the same as that which is now called the cow cabbage. It was introduced from France, where it was cultivated by the Marquis of Turbilly, who gave instructions thereon. 'It is a tall upright plant, from six to eight feet high, furnished with loose open leaves all the way up the stem. The plant may be raised from seed in August, and transplanted in March, on five feet ridges, in single rows, two feet apart in the rows, and these head as the Scotch cabbages. This cabbage or colewort casts its summer leaves in November and December, and puts out new leaves afterwards. The best way of using the plant is to feed off the leaves with sheep before they decay, and they will eat off all the leaves clean to the height of above four feet. These tall plants are excellent shelter for sheep and lambs, which are very fond of the leaves, and they fatten well on them. The leaves that grow above the reach of the sheep are eaten greedily by horses, which eat all the upper leaves without damaging the stem; and when the first or summer leaves are all eaten off by the sheep and horses, then all the cattle are shut out till new leaves are produced, and are fed as before. They continue to produce leaves all winter till May; they produce above 178 upon each plant, and near 20 tons per acre.'"

Perennial Native Grass—(Elymus Virginceus.)—The following is the botanical description of the *Native Grass*, an account of which is given by Mr. Terrill, p. 303, and referred to on several occasions by us. The seeds are now ripe, and small parcels will be forwarded to those who may wish to make a trial of it. The proper time for sowing the seeds is in the months of September and October.

Botanical description of Elymus Virgincus.—Spike erect, spikelets three flowered, awned, glabrous, by pairs; calyx lanccolate, nerved, as long as the spikes. Sp. pl. i. p. 469. Mich. i. p. 65. E. Carolinianus, Walt. p. 82. Pursh. i. p. 89.

Root perennial. *Stem* 2—3 feet high, erect coluninar, glabrous. *Leaves* 8—12 inches long, 2—3 lines wide, acute, scabrous; sheaths glabrous; stipules very short or none. *Calyx*, 2 valves to each spike of florets, somewhat lateral, so that the calyxes form a sort of *involnerary* around

the inclosed spikes; valves, lanccolating thick, flexuous, deeply striate, terminating in an awn about their own length. *Corolla* 2 valved; the exterior lanccolate, concave awned; the interior lanccolate, obtuse, serrulate, as long as the exterior valve excluding the awn. The *awn* of the exterior floret longer than the awn of the calyx; the other gradually diminishing in length. My specimens have generally four perfect florets, besides one or two abortive ones on each spike. Grows generally in dry soils. At the Sisters Ferry, Savannah River, on its margin. Flowers in June—August.—*Elliott's Botany.*

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Euchre.—After breakfast, in looking round the place, we perceived seventy or eighty bushels of euchre, just dug from about a quarter of an acre, grown from slips in seven months; and as it yields a crop and a half in a year, four hundred and twenty bushels, with little cultivation, and is esteemed nearly twice as nutricious as the sweet potatoe, it is a fine crop. It yields the best of starch, and is a pleasant addition to the variety of negro diet, as well as to the planter's table. It is a species of cassavi or cassada.—*Abbott's Cuba.*

This plant is now growing at Tivoli Garden, where it can be seen. It has also been introduced this spring into several private gardens, and we hope to give some account of it hereafter.—*Ed. So. Ag.*

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Plugging Trees.—This operation is a very efficient remedy for destroying caterpillars, aphides, and other insects preying upon the leaves and limbs of fruit trees, ornamantal and shade, fine shrubs, &c.

It has often been desired to find such a remedy. Rewards have been offered to destroy easily, and speedily the insects of fruit trees. Our shade trees are covered every year with disgusting and voracious caterpillars. Year after year, new, troublesome and costly means are proposed, which are inefficient; while this very easy and cheap way to poison and destroy at once all the insects of any tree, is so little known that our farmers and gardeners appear to be unacquainted with it. It was discovered in France, and I have verified it, by actual experiment. I now publish it again, and request editors friendly to agriculture to spread the knowledge of it every where.

This simple operation consists in boring a hole through a tree with a gimblet, about one third of the diameter of the tree, in depth. Fill the hole with a small quantity of *Flour of Sulphur*, and plug the hole by driving in it a wooden peg. This does not injure the tree in the least; but the sulphur is decomposed or carried into the circulation by the sap, and is exhaled by the leaves in a gacious state, while it poisons and kills all the caterpillars and insects preying upon them. Whether boring and plugging with sulphur the roots of the peach tree and other trees whose roots are injured by insects will answer as well, is unknown to me, not having tried it; but it is worth while to make the experiment—the result may be favourable.

C. S. RAFINESQUE, Professor of Botany, &c.—*Even. Post.*

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Bearing of Apples.—A horticulturist in Bohemia has a beautiful plantation of the best sort of apple trees, which have neither sprung from seeds nor grafting. His plan is to take shoots from the choicest sorts, insert them in a potatoe, and plunge both into the ground, leaving but an inch or two of the shoot above the surface. The potatoe nourishes the shoot whilst it pushes out roots, and the shoot gradually springs up and becomes a beautiful tree, bearing the best fruit, without requiring to be grafted.—*Lancaster Jour.*

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Prolongation of Ripe Grapes.—A correspondent of the Gardener's Magazine states, that he has succeeded in preserving grapes in a green house from

the month of August to the month of March following, by "tying the bunche in a paper bag, and leaving it on the vine," and when cut, it was "in a perfectly good and highly flavoured state."

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Dried Apples and Pears.—The apples and pears which arrive here in a dried state from France, are thus prepared. The fruit is put into boiling water, in which it is left until it becomes soft. It is then taken out and carefully peeled, the stalk being left on. To prevent any loss of juice, it is placed on a strainer, under which is a dish. When peeled, it is put into an oven heated to the ordinary temperature for bread, and left there twenty-four hours. When taken out and cold, the fruit is pressed flat between the hands; and after being plunged into its own juice, which has been set apart for that purpose, it is packed in boxes and exported.—*Lit. Gaz.*

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Preservation of Orange Trees.—Fleshy fruits, such as oranges, apples and pears, requiring a great quantity of sap to supply sustenance, occasion a great absorption by the roots These plants are, consequently, particularly liable to injury from frost; and when thus endangered, it is a useful precaution to gather the fruit, in order to secure the tree. In the south of France, the oranges are gathered on the first appearance of a frost; and should this operation not be completed before the frosts set in, it frequently occurs that the side of the tree on which the fruit remains is attacked by the frost, while that on which it has been gathered escapes uninjured.—*Conversations on Vegetable Physiology.*

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To destroy Slugs.—I have always remarked that slugs will attack the leaf of a somewhat withered cabbage, in preference to those a in more thriving condition. When I plant out a bed of cabbages, therefore, I strew the leaves that I cut off all over the bed, and the slugs will lie under them, and feed on them in the shade. Every day or two I have the leaves gathered up and given to the pigs, and then strew more leaves; and so on till I yet rid of the slugs entirely.—*W. B. Rose.*

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Shallots.—I frequently hear it mentioned by different persons that they find a difficulty in growing these useful and piquant roots. I formerly did so. I have for several years past planted my shallots in drills about the middle of March, putting in each drill a small sprinkling of salt; upon that a layer of *dry soot*, about half an inch thick. I then plant the roots upon it, about six inches apart, and immediately cover in and beat down the soil with the back of the rake. By this method I uniformly succeed in getting excellent crops of large and sound clusters of bulbs.—*Gard. Mag.*

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Rules for making good Butter.—If you have four or five cows, it is best to churn every day, and by no means less frequent than every other day. If you cannot churn every day, throw into the cream when gathered, a handful of nice salt. In very warm weather, when milk sours soon, put two heaping table spoonfuls of salt in every pail of milk, before straining. The quantity as well as the quality of the butter is greatly improved by this method. If you have ice, put a small piece into every pan of milk, and also into the cream when you churn. If you have no ice, put the cream into a pail, and hang it into the well, twelve hours before churning. In the warm season, cream should be skimmed as soon as it is in the least sour, and in the coldest weather milk should not stand more than thirty six or forty eight hours. The utmost care should be taken to keep every article used in making butter perfectly sweet, by frequent and thorough scalding.—*Journal of Humanity.*

Improvement of Cider.—The following information relative to cider is contained in a letter from T. A. Knight, Esq. addressed to J. Lowell, Esq. and published in the New-England Farmer.

"I think that last year I discovered a mode of improving cider, which renders it more wholesome, and enables me to obtain from apples which are without acid, a liquor as free from acid as any kind of wine.

"During the fermentation of cider sherry, though it be called vinous, a good deal of acetous acid is, I believe, always generated, making those liquors more or less harsh, that is, really acetous. I mix in each hogshead of 110 gallons, from seven to eight pound of newly burnt charcoal finely powdered. This mitigates fermentation, rendering the liquor as black as ink so long as it ferments, but as soon as fermentation ceases, the charcoal is deposited, carrying with it all impurities, and leaving the cider excessively bright. No taste or smell is given to the liquor by the charcoal, that being wholly insoluble.

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Preservation of Eggs.—Relative to the preservation of eggs by immersion in lime water, M. Peschier has given most satisfactory evidence of the efficacy of the process. Eggs which he had preserved for six years in this way, being boiled and tried, were found perfectly fresh and good; and a confectioner of Geneva has used a whole cask of eggs preserved by the same means. In the small way, eggs may be thus preserved in bottles or other vessels. They are to be introduced when quite fresh, the bottle then filled with lime water, a little powdered lime sprinkled in at last, and then the bottle closed. To prepare the lime water, twenty or thirty pints of water are to be mixed up with five or six pounds of slacked quick-lime, put into a covered vessel, allowed to clear by standing, and the lime water immediately used.—*Arcana of Science.*

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Market for Cocoons.—The United States Gazette enables us to state, that Mr. Garesche of Philadelphia, will purchase any quantity of good cocoons. The price will vary from 40 to 50 cents a pound—or from $2,50 to $3,00 a pound.—*Amer. Farmer.*

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Phenomena of Dew.—Why should dew be more abundant in fine clear weather than in cloudy weather equally warm, and the open lawn than under the shade of trees? The reason given is, that in clear weather, and in the open lawn, the surface of the earth, during night, is cooled, farther down than if there were clouds or trees over it to reflect back again the heat that streams up from it. Why, if we have risen by daybreak, are we so often astonished by finding the ground covered with hoar frost after a fine clear spring or autumn day? The reason is, that in very clear weather, the ground cools itself so far, that there is scarcely a month in the year when it is not liable, at some hour of the night, to be cooled down to the freezing point. Why can we protect peach blossoms, in early spring, from being destroyed by frost, simply by hanging a net over the tree? One would think that frosty air would have as free access to them through the meshes of the net as if they were altogether exposed. But it is not the air that is frosty, it is the blossoms themselves; and the net, like a cloud, prevents them from becoming cold to this degree; and as the object, at this early season in our climate, is to give the flower beds as good a constitution as possible, to keep them cool, but to prevent a chill, net-work over them may be a more appropriate covering than mats. But the quantity made use of any particular night, should of course depend on the quantity of cold that would probably be generated on them during that night.—*Quart. Journ. Agr.*